The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XIII. No. 339 DECEMBER 12, 1925 Prepaid Annual Subscription: United Kingdom, $3.3.0; Abroad, $3.8.0.

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE *is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.*

Editorial and General Offices—8, *Bouverie St., London, E.C.4.*

Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (6 lines).

The German Potash Issue

THE financial sensation of the week has been the successful flotation in this country by the Potash Syndicate of Germany of an issue of £5,000,000 seven per cent. bonds. Within fifteen minutes of the opening of the list on Tuesday morning, subscriptions to the amount of 60 millions are reported to have been received, and the list was promptly closed. The terms were unusually attractive, the issue price being £94½ and the redemption price £102½. These bonds, together with £3,000,000 issued simultaneously in Holland, Sweden, and Switzerland, constitute Series A and form part of a total authorised issue of £15,000,000. The United States, it is understood, declined to take any part of the issue, probably because the antagonism to Germany is still stronger there than it is in Europe and partly because America still clings to the belief that it has a potash industry of its own to maintain. The American attitude, however, is not likely seriously to affect the Potash Syndicate's position in view of the fact that six important European countries are now definitely interested in the success of the German potash industry.

It is, of course, from the chemical and commercial, and not from the purely speculative side, that we are interested in this new development. For some time after the close of war, there was a very active movement to develop the trade in French potash obtained from mines which, with the restoration of Alsace-Lorraine to France, once more passed from German into French possession. But the potash industries of these two countries have now agreed upon terms upon which the world's requirements outside those countries are to be supplied. The only important developed deposits of potash are in Germany and France, and the German deposits alone are estimated to amount to thousands of millions of tons. In spite of the growth in the production of synthetic ammonia, the position of potash remains practically unchallenged, because our authorities on the use of fertilisers now agree that the best results are obtained by a judicious mixture of different types of artificial fertilisers, in which potash is always a principal constituent. It must, therefore, remain, whatever developments take place elsewhere, one of the most important fertilisers, because its compounds, together with those of nitrogen and phosphorus, are essential to maintain and increase the fertility of agricultural land.

The effect of this new issue upon the condition of the German industry is bound to be important. The Syndicate was formed in 1919 to control the German potash industry, and it holds until the year 1953 the sole right to sell, distribute, export from and import into Germany potash and potash compounds. The Syndicate, which includes every owner of a potash mine or factory in Germany, has 144 members, who own 221 potash mines and factories connected therewith and seven independent factories not connected with any mine. In order to concentrate and cheapen production, only 90 of these mines are at present being worked. The working of the remainder is for the time being voluntarily suspended and their quotas are being dealt with by those in operation, which are sufficient to supply at present all demands. The proceeds of this new issue of £8,000,000 bonds will be used to develop the industry so as to make possible through increased efficiency in mining and manufacture the supply of potash at lower prices. This will necessitate the extension, modernisation, and consolidation of factories and plant, and the building of warehouses, improvements in transport, and the enlargement of harbour facilities. The Syndicate will also be put in funds to enable it to reduce its existing floating obligations and to pay off its funded debts, the latter amounting approximately to £2,350,000. The success of the loan is a striking tribute to the public belief in the soundness of the German potash industry and an illustration of the rapid change from hostility to friendship which has taken place since the war.

Another interesting issue this week was that of the Nuera Art-Silk Co., Ltd., of which Dr. H. Levinstein, of Manchester, is one of the principal directors, and

Mr. J. Huebner chief technical adviser. The company has arranged for the acquisition from Mr. Otto Sindl and the Maurer Textilmaschinen G.m.b.H., both of Breslau, of their patents, processes, plans and designs, and has decided to reproduce in England the Breslau factory. The vendor concern has contracted to provide the plans, specifications, and designs of the buildings, plant and machinery, to superintend their erection, and to supply the company as required with the exclusive benefit of their experience. They have also undertaken to supply an efficient and competent staff to start the English factory and to train an English technical staff to be provided by the company. It is another example of the closeness with which the chemical industry and the artificial silk industry are becoming associated.

Effluents from Ammonia Plants

At the autumn general meeting of the Midland Association of Gas Engineers and Managers, Dr. Bailey, the Chief Inspector of Alkali Works, gave a résumé of the paper on "Effluents from Ammonia Plants," which he read before the Society of Chemical Industry at its annual meeting in Leeds. From the discussion which followed, it is clear that the provision of a satisfactory and economical method for the treatment of spent effluent liquor is still an acute problem, and that a solution is eagerly awaited. What is not quite so clear is whether the crux of the problem has been adequately appreciated. A good deal was said about keeping tar and liquor separate, presumably with a view to avoiding unnecessary contamination. Again, the merits of the adoption of an "acid washer," to which we directed attention in an article in our issue of August 30, 1924, were freely urged, but it is doubtful whether this method will have the effect of reducing appreciably the toxic character of the gas liquor. True, it will serve the purpose for which it was recommended, namely, the provision of a more concentrated gas liquor. In so far as this is attained the quantity of effluent liquor to be treated will be reduced, but the toxicity of the gas liquor will not be reduced in proportion to the reduced volume of the liquor, because the virgin liquor has the greatest toxicity. The liquor arising from the scrubbers can be reduced to a low degree by ordinary care.

What appears to have been overlooked is the fact that if tar is condensed, as is the case at most gasworks, at the time of the formation of the virgin gas liquor, the toxicity of the total gas liquor will be such that some process of treatment will be necessitated, if the demands of the sewage authorities are to be met. Surely the temperature at which ammonia is absorbed by condensed steam is below that at which the bulk of the constituents that go to form tar are liquefied. Is it not possible, therefore, to remove the greater part of the tar-forming constituents from the crude coal gas, certainly those which interact physically with the gas liquor and cause toxicity, by adopting a process of fractional condensation? From a careful consideration of the problem we feel that a process on the above lines will need to be adopted, and that, in addition, steps must be taken to reduce the formation of ammonium sulphocyanide in the gas liquor to a minimum. It is our view that the latter problem is not beyond solution. Only by the adoption of some such methods as those outlined is a satisfactory and economical solution of the sulphate plant effluent problem likely to be reached.

Portland Cement Retarders

The rapid growth in the use of concrete for all forms of structures has turned the attention of both chemist and engineer towards a close study of the properties and means of manufacture of Portland cement. One of the most interesting of the problems now receiving consideration is the relation between the time of setting and the ultimate strength of concrete. As is probably well known, all cement clinker contains a small quantity of a retarding substance which delays the initial set, increases strength, and adds to the plasticity of the cement, thereby imparting to it the desired working and setting qualities. The retarder most commonly used is calcium sulphate, but the actual part played by this compound has received little consideration in laboratory research, partly, it is said, owing to a peculiar inconsistency in its behaviour when dealt with on a laboratory scale and on a manufacturing basis. A praiseworthy attempt has, however, lately been made by the United States Bureau of Mines to determine what substances are best adapted for retarders, but the difficulty of carrying out an investigation of the kind will be appreciated when it is remembered that cement clinker is a complex mixture of calcium silicates and aluminates, and that nearly every mill turns out a product having its own particular chemical constitution.

The American research was mainly carried out with the object of determining the relative behaviour between the three forms in which calcium sulphate is available, namely, gypsum, plaster of Paris, and anhydrite. It has for long been realised that a wider field of utilisation of anhydrite would be of considerable advantage to the gypsum industry, for many of the gypsum deposits are troubled by the undue presence of anhydrite, which is often difficult to dispose of. The results of the American work are by no means unpromising, for although it was found that anhydrite, when used alone as a retarder, failed to produce a satisfactory cement, it appears to present considerable possibilities when admixed with other forms of calcium sulphate. Anhydrite used by itself called for a large quantity of mixing water, it retarded only those samples of clinker which were of themselves slow-setting, and the final cement was generally weaker than that which had been retarded with any other form of calcium sulphate. On the other hand, the use of mixed retarders produced a more satisfactory cement than could be obtained by the use of any one form of calcium sulphate alone, and the value of mixed retarders seems to be practically independent of the calcium sulphate used so long as there is sufficient sulphuric anhydride (SO_3) present as plaster of Paris. These last-named conclusions should have some considerable bearing on the more extensive utilisation of calcium sulphate deposits, but it will be necessary to proceed with caution in view of the fact that the American results are entirely based on laboratory work and that it has not yet been possible to carry out tests on a really large scale.

New Use for Finsbury College

MR. F. H. CARR, in his Streatfeild Lecture on "The Scientific Basis of Industry," this week, made an interesting suggestion for the future use of Finsbury Technical College, which, to the deep regret of its old chemical students, is shortly to be closed. What the college has done in the past through a group of the most stimulating chemical teachers this country has known, what it is doing to-day through the chemical and technological work of the many brilliant and distinguished students who have passed through its courses was by no means over-described in the lecturer's tribute. But the college, as a centre of chemical education in the old sense, is definitely under sentence of death, and Mr. Carr used the occasion of the Streatfeild Lecture to offer proposals for its reprieve and its survival in a new form which may nevertheless retain something of the old spirit and association. Shortly, he proposes that it should be utilised as a School of Chemical Engineering. This obviously implies the raising of a substantial fund and agreement on the general principles of the scheme among a number of interests now concerned in the training of chemical engineers. The idea, however, is distinctly attractive, and an energetic committee of old friends of the college is all that is necessary to ensure its serious consideration by the authorities whose assent is necessary in the first stage. The proposal, at the very least, is entitled to this. Apart from the future of the college, Mr. Carr had much of interest to say respecting the general education of chemists, and many will agree with his view that the tendency of chemical training in the past has been to produce too many of one type.

Evaporation of Dissociable Liquids

THE evaporation of solutions that dissociate readily has always been fraught with some technical difficulty. It is known that in the production of ammonium chloride lead trays with lead steam coils have been used for many years, but apart from being extravagant in the consumption of steam, a not inappreciable expense has been incurred in the renewal of the coils. A material improvement in the consumption of steam has been rendered possible by the adoption of the horizontal type of film evaporator, but here, again, the question of the suitability of the metal of the tubes has arisen. Although some investigatory work has been undertaken in this connection, a solution of the difficulty is still awaited, and meanwhile the effects of corrosion, due largely to hydrochloric acid—a product of dissociation—are evident from an examination of the repairs and maintenance item of the ammonium chloride cost sheet.

Trials which have recently been made suggest that the problem to which reference has been made is likely to be satisfactorily solved by the evaporation of ammonium chloride solutions by a novel process, involving contact of a submerged flame with the actual liquid undergoing evaporation. It is too early yet to reveal all the details of this patented process, but it is known that the new method has many potentialities and will be capable of tolerably wide application. Two features at least merit notice. First, by adopting this process, earthenware vessels or suitable vessels lined with Cabtyrit can be used, on account of the moderate temperature of the liquid adjacent to the walls of the vessel. Secondly, a reduced temperature of evaporation is made possible, in that Dalton's law of partial pressures obtains under the conditions of the new method. This preliminary information will probably stimulate our readers' interest in further details of the nature and scope of the development foreshadowed.

Books Received

DAS KOLLOIDE GOLD. Vol. 1. By R. Zsigmondy and P. A. Thiessen. Leipzig: Akademische Verlagsgesellschaft. Pp. 226. 14 marks.

APPLIED CHEMISTRY. Vol. II.—FOODS. By Dr. C. Kenneth Tinkler and Helen Masters. London: Crosby, Lockwood and Son. Pp. 276. 15s.

REPORT ON THE ECONOMIC AND INDUSTRIAL CONDITIONS IN FRANCE. (Revised to July, 1925.) By J. R. Cahill. London: H.M. Stationery Office. Pp. 301. 8s.

The Calendar

1925 Dec.		
11	Physical Society of London. 5 p.m.	Imperial College of Science, South Kensington, London.
12	Mining Institute of Scotland: General Meeting. 3 p.m.	Royal Technical College, Glasgow.
14	Institute of Chemistry (Manchester Section): General Meeting. Short address by Dr. Herbert Levinstein, on some recent activities of the section. 7 p.m. Followed by a Social Evening.	Grand Hotel, Portland Street, Manchester.
14	Worshipful Company of Dyers: "Recent Researches on Mordant Dyes." Professor G. T. Morgan. 6 p.m.	Dyers' Hall, Dowgate Hill, London, E.C.4.
15	Sir John Cass Technical Institute: "Metallurgy and Minting." Sir Thomas Kirke Rose. Distribution of Prizes. 7.45 p.m.	Jewry Street, Aldgate, London, E.C.3.
15	Hull Chemical and Engineering Society: "Emulsification in Chemical Industry." H. M. Langton. 7.45 p.m.	Grey Street, Park Street, Hull.
16	Society of Glass Technology: "The Composition of Glass Suitable for Use in Automatic Machines." Professor W. E. S. Turner. "The Relationship between Chemical Composition and the Durability of Glass." Violet Dimbleby and Professor W. E. S. Turner. 2.30 p.m.	University College, Gower Street, London.
16	Chemical Engineering Group. Joint Meeting with the Nottingham Section of the Society of Chemical Industry: "Some Effects of Humidity on the Properties of Fabrics." R. G. Parker and D. N. Jackman.	Nottingham.
16	Institute of Chemistry (Belfast Section): Discussion on "Chemical Publications."	Queen's University, Belfast.
17	Institute of Chemistry Students' Association (London): Discussion on "Regulation of the Institute."	30, Russell Square, London, W.C.1.
17	Chemical Society: Informal Meeting. 8 p.m.	Burlington House, Piccadilly, London.
18	Institute of Chemistry (South Wales Section): "Industrial Aspects of Botany" Dr. Florence A. Mockeridge.	Technical College, Swansea.
18	West of Scotland Iron and Steel Institute: "Speed Control in Relation to Modern Rolling Mill Drives." L. Rothera.	Royal Technical College, Glasgow.

The Scientific Basis of Industry

Streatfeild Lecture by Francis H. Carr, C.B.E., F.I.C.

In the Streatfeild Memorial Lecture (a summary of which is published below) at Finsbury Technical College on Thursday, December 3, presided over by Sir William Pope, Mr. Carr pleaded for the utilisation of the College as a school of chemical engineering. During the proceedings Mr. Carr was presented with the Streatfeild Medal, and Mr. H. H. Doulton with the Streatfeild Prize for the best student in practical chemistry.

THE science development of industry is a fundamental part of modern civilisation, and the prosperity of nations depends on the utilisation of science. The foundation of Finsbury Technical College for promoting education in science exercised profound influence on University and technical education, and the success achieved was largely due to the independence and freedom granted to those great teachers—Armstrong, Ayrton, Perry, Meldola, and Thompson. Teaching by the experimental method was initiated and developed here, and every hypothesis was cultivated in an atmosphere of doubt.

The college can no longer be continued. In a few months it will close, in spite of the great purpose it has served, and this fact will produce in many a feeling of deep disappointment, though warm thanks are due to the City and Guilds for their great work here during over 40 years.

Too Many Chemists of one Type

Judged by the achievement of engineers and chemists trained by the methods initiated by the City and Guilds of London, there is ample justification for the claims made for the value of science in industry; but there is danger that we may assume that a particular training is the only one that industry requires in its recruits. As one of Streatfeild's pupils, I wish to raise in others the doubt whether our educational system is not open to criticism that it produces more trained chemists of a certain type than our industries can absorb, and yet it fails to produce enough of another kind greatly needed by the industry, and on whom the employment of the usual type of trained men largely depends. We have met the complaint that the introduction of the university man into the works causes dissatisfaction, that apprenticeship produces men more suited to the employer's needs than does the university, and the trained men complain that they are confined to the laboratory. For many reasons there is a pressing need to find some means of bridging the gap between the laboratory and the works.

There are few industries, if any, which do not need better technical achievement, while in many more efficient production and better standardisation would bring greater prosperity, higher wages for workers, and increased employment. Managers and foremen of the self-educated apprentice type, good as they are, would be more successful if better education had been provided for them. Greater numbers of chemists do not become managers and foremen because of their impracticability for production, not because of the natural distinction between an academic and an industrial laboratory, though it is often a fault of the former that its habitués, seeing no necessity for monetary outcome of their labours, look down on those engaged in such practical affairs.

The view here put forward regarding established methods of chemical education is contrary to the hypothesis that education in this country is doing the best for applied chemistry. University and college training in physics, chemistry, and mathematics provides the best general foundation for a career in any branch of science, and three or four years can at best provide only a foundation on which a structure of special knowledge and experience may be erected afterwards.

There is a strong tendency to train for the industry one type of chemist whose training consists of chemistry, physics, and mathematics, and when this is followed by one or two years at research its character does not usually take the student outside the same field of study. Such training may be the best for most men seeking careers in chemistry, but it is not the best for all types, and it does not form the best starting-point for all kinds of posts in the industry.

Some men possess the instincts of a technologist to whom mathematics beyond the early stages is anathema, who can only take a remote interest in the theory of light or the constitution of the atom, but who takes a keen interest in the problems of applied mechanics, the transference of heat, etc., men who cannot compass the abstract, but delight in the practical, and who may become first-class industrial thinkers and leaders. This kind of man is extraordinarily successful in chemical technology, developing sound judgement, clear perception, and a sense of proportion.

The Value of the Technologist

Many agree that we suffer in this country from a lack of men specially trained for chemical engineering. Men of the kind referred to and others wishing to devote themselves to factory life could meet this need if trained in a curriculum where the physics and chemistry are of a more practical type than that suited for the university examination syllabus subsequent to the intermediate science standard. After this a foundation suited to the training of a chemical engineer should be laid, since the training at present dictated by examination syllabuses is not best suited for this purpose.

Opportunities to develop chemical engineering during the years immediately following college training are very few, because the college foundation has not been suitable. For this reason employers will not allow the men to take part in actual manufacture, and mostly they regard the young graduate as not only unqualified for such work, but as definitely unsuitable for it, and his activities are restricted to the laboratory. Present students should remember that much depends on the use they make of so-called spare time when they take their first post. In such time they will have to make themselves masters of the subjects relating to their daily work.

I greatly deplore the present tendency to regard the attainment of a degree as an end in itself, implying qualifications for earning a living. While much may be said for a training in research in preparation for industry, it is not correct to say that this course is the best preparation irrespective of a man's abilities for the career he may afterwards follow. Often research does not awaken that keen enthusiasm and absorption without which it is a poor method of training, accompanied by waste of money and loss of opportunity at a time when it is good for the student to face drudgery and learn to persevere with monotonous tasks. Apart from educational value, the ultimate test of research is whether its application adds to the physical, mental and moral good of humanity.

In this country we need men who can apply chemistry to industry more than men who will advance our knowledge of the science. England has led the world in chemical science and also in those applications where the work of the engineer is readily divorced from that of the chemist, e.g., in the manufacture of soda and sulphuric acid and, in some respects, in the gas industry; but in organic chemical industries requiring exact methods of control and intricate plant design, others have outstripped us because it is essential to have a clear conception of the chemical difficulties and the mechanical devices for overcoming them. There are problems in which the work of the chemist and engineer cannot be divorced, and there is at present a serious lack of men trained as chemical engineers capable of solving the problems of setting up new manufactures and revolutionising the established ones.

The Cost of War Mistakes

Combined training in chemistry and engineering has been given in this college since its inception and its students are still keenly sought after in the industries. For many years the need for training chemical engineers has been felt and fully recognised, but no adequate facilities for providing this training has been given in any part of the country, and although the Finsbury curriculum includes chemistry and engineering, the development of chemical engineering there has fallen short of what is greatly needed to-day. At the same time, the closing of this College does accentuate the need.

On the outbreak of war in 1914 delay and confusion resulted from lack of men able to apply existing knowledge to the large

scale production of explosives, gas, medicinal products, etc. These were obtained in the end, and Finsbury chemists played an important part in setting up the manufacture of essential products. With a few more chemical engineers many millions of pounds might have been saved and much suffering avoided; less than 1 per cent. of the cost of mistakes in setting up technical production then would provide the foundation of an adequate school of Chemical Engineering. It is not chiefly to supply necessities of war that I now advocate the teaching of chemical engineering; it is that we may profit more by applying chemistry to industry.

New Use for Finsbury College

At the time when Finsbury Technical College is about to be closed there is need for chemical engineering training on a scale adequate for our requirements, not a continuation of what has been done there, but a new development of it requiring adequate buildings and endowment and a joining of forces of all who wish to solve a great and urgent problem. Such an advance would be comparable to, but greater than, that of the City and Guilds in founding colleges of mechanical and electrical engineering, and I believe the Council of the City and Guilds of London Institute will give favourable consideration to any scheme which promised reasonable prospects of success. Little difficulty should be encountered in forming a body for directing the work. I would look to the City and Guilds Council to appoint a delegacy consisting of representatives of their own Institute, the Association of British Chemical Manufacturers, the Institution of Chemical Engineers, and others who might help in the realisation of the great purpose.

At University College, London, the Ramsay Memorial Laboratory of Chemical Engineering was opened two years ago. Those responsible for its inception have in view the same objects as those now advocated, but, owing to small endowment, growth and expansion are rendered difficult, and an appeal has recently been made for funds to erect suitable buildings. The laboratories and buildings of the Finsbury College are to be vacated shortly, and it is not impossible that the City and Guilds in their goodness would assign these buildings to such a purpose, and possibly the Ramsay Memorial Laboratory would collaborate in the development of a College of Chemical Engineering. Alternatively, an endowment of £200,000 by a high-minded patriot might be sought, failing which, we need to secure an annual income guaranteed for a term of years. With buildings and equipment provided, £10,000 per annum, plus fees from students, would probably maintain a College of Chemical Engineering, and with promise of such an income guaranteed for ten years, the City and Guilds might be approached with a view to acquiring premises, at the latest by February next. If my proposals meet with approval, I would ask representatives of the bodies named to meet and explore the possibilities of finding the money.

If what has been said will bring about the realisation of such a scheme of technical education, we shall have done something worthy of Armstrong, Meldola, Streatfeild, and Evans, and those who have followed in their steps.

S.C.I. Visit to Engineering Exhibition

Over 200 members of various technical institutions, including the Society of Chemical Industry, were entertained at Olympia on Saturday, December 5, by the organisers of the Shipping, Engineering and Machinery Exhibition, which concluded last week in London. About 40 institutions were represented, Sir Charles Parsons, F.R.S., president of the exhibition, presiding at a luncheon given to the councils of the societies, which Mr. W. J. U. Woolcock attended on behalf of the S.C.I. In the afternoon a reception for members was held by Mr. F. W. Bridges, the organiser, and tea was afterwards provided.

Dr. Hele-Shaw, chairman of the exhibition committee, in welcoming the visitors, emphasised the objects of the exhibition. Mr. C. S. Garland, chairman of the engineering group of the Society of Chemical Industry, responded, and in moving a vote of thanks to the committee, said that, while this was the first occasion that the society had been officially invited to attend, chemistry and industry were so largely dependent on each other that the association was a natural one. To take an example, the production of nitrogen from the air, a chemist's invention, could not have been put into practice without the high pressure plant provided by the engineer. Mr. Watson, of the Institution of Engineers-in-Charge, seconded the vote of thanks. In replying, Mr. Bridges said that the old idea of laboratory confinement was superseded and the chemist was now taking an ever greater part in the production side of industry. The exhibition was organised to stimulate trade, and he was glad to say that it was the most representative and successful so far held.

Three Centuries of Chemistry*

Review by Professor Charles Singer

Professor Masson has not given us another history of chemistry. He has, however, done something that is much more difficult, and perhaps much more useful. He has produced a most entertaining and readable volume, packed with research of a kind to give the chemical student an insight into the kinetic and dynamic character of the study in which he is engaged. A dull student indeed must be he who, under such guidance, does not gain some glimpse of the interest and value of historical studies in the scientific departments. The majestic procession of scientific thought through the centuries has a beauty of its own which few can miss, if properly presented to them. There is a peculiar tang in the rare combination of learning and gaiety with which Dr. Masson writes that makes us look to him as a coming leader of scientific humanism. A book written in his challenging spirit can hardly hope to command universal assent—it is probably the last thing that Dr. Masson would wish. We ourselves think he greatly overrates Francis Bacon, and puts the scientific revival too late. But while you disagree with Dr. Masson, if once you begin you will certainly read him through. And this, when you come to think of it, is what books are written for. We heartily recommend this book to students and teachers of chemistry. We would express the hope that in the next edition, which we feel confident will be called for, figures will be included.

C. S.

The Prosperity of America †

Thomas Nixon Carver, Professor of Political Economy at Harvard University, has written a book which by its authority as well as by its literary merit puts a finishing touch to a batch of recent literature on the marvellous prosperity now enjoyed by America. All the astonishing statistics as to labour's motor cars, houses and investments, are reinforced with a reasoned statement of the policy which has in the main guided the American labour movement and brings out very clearly the wide cleavage which exists between working class opinion on the two sides of the Atlantic.

He shows how in pursuance of a constructive policy American labour has set itself not to fight but to increase capital, and has succeeded in providing for a continuous augmentation to the supply of this essential commodity. "At this point we should stop to notice the essential difference between primitive fighting tactics and the higher economic strategy. In primitive warfare you gain in proportion as you thin out your enemies." "The clear, cold fact is that in the modern economic world you gain in proportion as you increase the number of your enemies on the market." This doctrine has found such complete acceptance that Mr. P. Brady, of the American Federation of Labour, was able to state at a recent congress that out of 25,000 million dollars paid each year in wages 6,000 millions are saved and added to the capital fund.

Almost every American works of importance appears to have some sort of saving and investment plan in response to the universal determination of the labourer to become a capitalist. As a sample the case of the Philadelphia Rapid Transport Company may be quoted. The employees' investment trust in this concern owns one-fifth of the total capital, $10,300,000 worth of stock actually belonging to the manual workers, who, in addition and in the same way, have $2,056,650 of Government and other securities by way of reserve.

* Three Centuries of Chemistry. By Irvine Masson, M.B.E., D.Sc., F.I.C. London: Ernest Benn, Ltd. Pp. 191. 10s. 6d.

† The Present Economic Revolution in the United States. By T. N. Carver. Little Brown and Co. $2.50.

The Chemist and the Community

Professor Henderson's Plans for Educating the Public

THE staff and students of the School of Chemistry, Liverpool University, gave a soirée on Friday, December 4, when the guests numbered upwards of four hundred and included the Lord Mayor and Lady Mayoress of Liverpool. There was a display of inorganic, organic, and physical exhibits and also practical demonstrations.

In the course of the evening PROFESSOR G. G. HENDERSON, D.Sc., F.R.S., delivered a lecture on "The Chemist and the Community," in which he said the importance of the services rendered to the community by the chemist could hardly be exaggerated, and in many departments of national activity he was indispensable. The majority of people were ignorant of this, and the profession of chemistry thus did not receive due recognition. The business of imperial and local government could not be carried on efficiently without the aid of the chemist. Practically all the Government Departments found it necessary to employ members of the chemists' profession. There was also the employment of chemists by county, municipal, and other public authorities.

Speaking of medical progress, the Professor said that on the pharmaceutical side the chemist had provided the physician not only with the active principles extracted from innumerable drugs, but with a vast number of synthetic medicines many of which included very valuable specific remedies. Recent advances in physiology were to a large extent the result of the increasing success of the labours of bio-chemists, not to speak of the application of physico-chemical methods. Further, the detection and prevention of adulteration or pollution of foods, water, and air, the treatment of sewage, etc., were necessarily entrusted for the most part to chemists.

Too Few Administrative Chemists

In any large industrial concern there were opportunities for several different types of chemists (research, analytical, and process), and chemical engineers in the administrative department and in the purely business side—buying and selling. It was worthy of note that here relatively few chemists occupied administrative posts. This arose partly from the tradition that a chemist had, of necessity, no business capacity and was therefore unfit to become a director or even manager of a chemical concern. Many cases could be quoted to show that this tradition had no foundation, but it must be admitted that as a general rule chemists did not prepare themselves for administrative posts by acquiring a knowledge of business methods. In this connection he reiterated the advice of Dr. E. F. Armstrong, whose career entitled him to speak with authority. Given that he was thoroughly trained and able to tackle any chemical problem which might arise, the successful chemist must be tactful in his dealings with his fellow workers, must possess self-confidence to enable him to take a prominent part in an industrial organisation, and must constantly endeavour to make himself more efficient. "Mere knowledge of chemistry," Dr. Armstrong said, "is not sufficient for a man who aims at a leading position in industry; it is the application of that knowledge which the world wants and for which it is willing to pay."

To show the various industries which depended upon the chemist, he quoted the research associations started under the auspices of the Department of Scientific and Industrial Research :—Cast iron, cocoa, chocolate, confectionery and jam trades, cotton, flour millers, glass, refractories, launderers. leather manufacture, non-ferrous metals, linen, motor and allied manufactures, photography, portland cement, rubber, scientific instruments, shale oil, silk, sugar, woollen and worsted, This list, of course, did not include all the industries in which chemists were engaged, and he would add the department of fuel research.

One reason for public indifference towards chemistry was that the products of chemical work did not impress themselves on the eye of the man in the street as did the achievements of engineering skill. Another reason was that chemists were not sufficiently assertive in their claim to recognition. They were generally so absorbed in their work that it was a matter of indifference to them whether or no the public recognised its value, except so far as their remuneration was concerned. As a rule they took no steps, either individually or through the medium of one or other of the chemical societies, to enlighten their fellow citizens, and it was at least partly their own fault if their profession had not the status to which it was entitled. It would without doubt be of advantage if chemists could be found who had the time and the inclination to devote some of their energy to public work, but he feared that the number available was necessarily limited.

Countering Public Indifference

In his judgment chemists must in the first place form themselves into a united body which might speak with authority as representing the whole profession, and secondly they must endeavour to educate the public. Welcome steps had been taken, and doubtless would be continued, to promote closer co-operation between the various societies and institutions concerned, but this movement would not, he thought, greatly affect the status of their profession. It was generally agreed that the institution of central headquarters, which should provide accommodation for all the societies and other bodies interested in chemistry, would be a great step in advance. The most important matter of all, however, was that they must have a professional organisation which could speak for all the qualified chemists in the country. The Institute of Chemistry was such an organisation, or at least was the very considerable nucleus which might develop into such an organisation, but for the present it did not include every qualified chemist in the country. Whilst membership might possibly be of little or no advantage to chemists themselves, it would be an indubitable benefit to the profession if they were to come into line with so many of their brother chemists by joining. There was also another group of chemists who were not qualified for admission to the Institute under present regulations. He fully recognised the difficulties, but he had not lost hope of surmounting them. As regards the educating of the public, his idea was to impart to their fellow citizens information regarding the widespread and all-important activities of the chemist. For this purpose they could not do better than appeal to the Press. For several years past the *Glasgow Herald* had published fortnightly articles descriptive of all phases of chemistry, and other Glasgow newspapers were opening their columns for this purpose. To his mind this was the most fruitful method they could adopt. If only their fellow citizens could be brought to understand that all industrial progress was ultimately based on scientific research, then without doubt, by means either of adequate Government support or of private beneficence, their universities and colleges would be relieved of those financial difficulties which at present so seriously hindered research.

In conclusion, Professor Henderson said he was conscious that he laid himself open to the accusation that these suggestions were put forward with the aim of magnifying the importance of their profession, but that was very far from his intention. They desired to bring into chemistry a still larger number of the brightest brains, and how could these be attracted unless their professional status was duly recognised and their remuneration adequate? His profound conviction was that the future prosperity of their country was largely dependent upon its attitude towards chemistry and upon its appreciation of the value of the work of the chemist.

A cordial vote of thanks was accorded Professor Henderson on the proposition of Professor I. M. Heilbron, seconded by Professor W. H. Roberts. A musical programme followed, and the arrangements were carried out by a general committee with Mr. I. A. Simpson as chairman, Mr. R. Hill as honorary secretary, and Mr. J. Williams as honorary treasurer.

Pigment and Lake Colours

THE latest pattern book issued by John W. Leitch and Co., Milnsbridge, Huddersfield, contains a wide selection of pigment and lake colours especially suitable for the manufacture of paints, printing ink and distemper. The colours are shown on a series of cards, contained in a neat case, and vary from pigment fast yellows to lake scarlets, with a wide range of intermediate shades. It is claimed that the colours are fast to light, lime, oil and heat, and there are some 20 shades to select from in this booklet.

Progress in Fine Chemicals

British Products now Equal to Foreign

MR. W. J. U. WOOLCOCK, president of the Society of Chemical Industry and general manager of the Association of British Chemical Manufacturers, gave an address on "Five Years' Progress in the Fine Chemical Industry" at a joint meeting of the London Section of the Society of Chemical Industry and the London and South Eastern Counties Section of the Institute of Chemistry at the Institution of Mechanical Engineers on Monday. Mr. C. S. Garland, chairman of the London section of the Society of Chemical Industry, presided.

Mr. WOOLCOCK first briefly outlined the position of the fine chemical industry in this country before the war and said that even then we had a fine chemical industry which manufactured so much as our strongest competitor allowed us to manufacture. He then dealt with the position during the war, the Safeguarding of Industries Act and the Dyestuffs Act, and the Sankey decision. Anybody who took a trip along the Rhine to-day would find that although the actual wages of the German workers were some 50 per cent. less than the wages paid in this country, there were no signs of any dissatisfaction or discontent. That was one factor with which we had to contend, whilst another was the present depreciation of the franc in France.

Whereas in 1913 the total weight of fine chemicals made by the 11 firms in this country was 69,945 cwts., that quantity had increased in 1924 to 215,240 cwts., made by 18 firms. The total weight exported by four firms in 1913 was 17,851 cwts., whereas this figure had increased to 33,154 cwts. in 1924 by 11 firms. Average increases of the firms in question were, in the home trade, 126 per cent., and in the export trade, 40 per cent.

All-round Increases

Coming to values, Mr. Woolcock said that the total value of fine chemicals made in 1913 amounted to £874,381, and this had risen in 1924 to £2,598,357. The value of imports had risen from £188,384 in 1913 to £570,675 in 1924. The proportion of the exports to the whole trade was 32 per cent. in 1913 and 27 per cent. in 1924, but the average increases in the value of the business done were, in the home trade, 184 per cent., and in the export trade, 122 per cent. These figures related only to the chemicals in List H under the Safeguarding Act. The total number of workpeople engaged by 14 firms engaged upon the manufacture of chemicals in List H in 1913 was 1,394, and in 1924 2,975 workpeople, exclusive of office staff, packers, and those otherwise engaged on the distribution staff. The increase was 114 per cent., but six additional firms had since taken up manufacture and the number of workpeople had been increased to 3,130 to-day. The number of qualified chemists in 1913 was 46. In 1924 there were 123 chemists, excluding well-trained men, frequently of university standing, who had not taken degrees. The percentage increase in this case was 186 per cent. The annual wages and salaries in 1913 amounted to £111,623, but in 1924 this had increased to £495,541, an increase of 344 per cent. The capital invested in 13 firms in 1913 was £936,917. These same firms increased their capital so that in 1924 the amount was £2,388,750, or an increase of 156 per cent. With the addition of the six new firms the amount had been increased to £2,536,762, but these figures were in themselves incomplete. The total number of individual substances now in List H is not greater than 4,969. In 1913, 16 British manufacturers made 1,334 substances. In 1922 the A.B.C.M. published a list of manufactures containing the names of 1,497 substances in List H, and in 1924 the same British firms, with six others, made 2,364 of the substances in List H. In 1911, Kahlbaum's English list contained 2,466 of the substances in List H, and in 1925 Kahlbaum's English list contained 503 of the substances in List H. Between 1920 and 1925 there had been price reductions varying from 15 to 55 per cent. 569 commodities had actually been priced and these showed a reduction in price between 1920 and 1925 amounting to 47 per cent. The reduction in prices had been largest in organic chemicals, rather than the inorganic chemicals. Prejudice had been lived down and proof had been given that the quality of British fine chemicals to-day was at least equal to any of the foreign made fine chemicals. Moreover, university laboratories and colleges were now perfectly satisfied with the quality of British laboratory chemicals.

Summing up, Mr. Woolcock said that while progress has been made, progress had been delayed by the flooding of the English market with enormous stocks of foreign fine chemicals due to Government delay, and the progress made was not sufficient. It was, however, an indication that we could develop in this country as good a fine chemical industry as could be developed in any other country granted we had the time and the opportunity.

Discussion

The CHAIRMAN, in opening the discussion, referred to the position of Great Britain in regard to the supply of monazite sand and the production of thorium and cerium, which were under the control of Germans, whilst two factories here endeavouring to manufacture thorium nitrate for gas mantles were compelled to use rock from Carolina, which rendered the cost of production of thorium nitrate ten times the cost in Germany. The other works was compelled to use such small supplies of thorianite as it could get from time to time from Ceylon. Fortunately, this position had now been completely changed. It could not be too highly stressed that every person who bought or sold foreign chemicals, was doing harm to some British chemist who was depending upon the manufacture of a similar chemical for his livelihood.

A Professor's Prejudice

Mr. F. H. CARR said there was too much tendency on the part of those who should know better to decry British chemical products. On one occasion he had been engaged in making some very pure chloroform, but was told that it absolutely failed to produce anæsthesia. The substance was immediately investigated again and tests showed that it produced precisely the anæsthesia which was anticipated and the criticism had been made without foundation. On another occasion a certain chemical was produced by him and sent to a professor; it came back with a very strongly-worded letter saying that it was execrable stuff, and that if British makers could not produce better this gentleman would be compelled to go to Germany again for his supplies. It was found that a sample had been obtained from Germany for purposes of testing here. By an unfortunate mischance this sample had actually been sent to the professor in question and his strong comments therefore were in regard to the German sample. When the mistake was rectified, the professor profusely apologised and said that the British article was infinitely better than what he used to have from Germany. It would take more than the few years' protection afforded by the Act to put the industry into the position it should be.

Professor A. G. GREEN said he had just returned from America and had been immensely impressed by the great impetus given to the fine chemical industry by the phenomenal development of the motor-car industry. Every part of the motor-car required chemicals. Great developments had taken place in paints and varnishes from nitro-cellulose by which cars could be coated with a very hard resistant surface in a few hours. The mechanical parts also required nickel and aluminium alloys. Our chemists should take advantage of these and other developments.

Dr. COX said the figures showed that the fine chemical industry to-day was three times what it was before the war, and the wages paid and capital involved were three times pre-war figures. Really the fine chemical industry should congratulate itself upon the rapid progress. British products now were equal to and in many cases better than the German fine chemical.

Dr. W. CULLEN agreed that there was a great deal of room for hope in the fine chemical industry. He urged that British chemists should preach the gospel of buying everything British.

On the motion of Mr. E. V. EVANS, seconded by Dr. CULLEN, a hearty vote of thanks was accorded to Mr. Woolcock, who briefly replied. He confessed that the position was really better than he had indicated, but he preferred rather to understate than to overstate the case.

B.D.C. and German Directors

WE learn on inquiry in London that the British Dyestuffs Corporation has no knowledge of the fact, generally reported in the Press, that Herr Bosch and Herr Carl von Weinberg left Germany on Monday for London to conduct negotiations with the B.D.C.

Sulphonation Products of *B*-Naphthol

Papers at Manchester S.C.I. Meeting

THE Manchester Section of the Society of Chemical Industry held its third meeting of the session on Friday, December 4, when Mr. L. G. Radcliffe presided. In a paper on "The Separation of the R., G., Schäffer, and Croceïn Acids and their Arylamine Salts," by C. M. Keyworth, F.I.C., and Dr. R. B. Forster, F.I.C., the products of the sulphonation of *b*-naphthol and their separation by ordinary methods were discussed. New arylamine salts of these sulphonic acids were described, and interesting methods for the separation of the important R., G., Schäffer, and Croceïn Acids by means of arylamine salts were explained.

The direct sulphonation of *b*-naphthol yielded many acids according to (*a*) the concentration and amount of H_2SO_4 used, (*b*) the temperature, and (*c*) the time of reaction. Using 90-96 per cent. H_2SO_4 at low temperatures oxy-Tobias acid was first formed. This, on heating, or by merely allowing to stand in an excess of sulphuric acid, went into a mixture of Croceïn and Schäffer acids according to the temperature. These latter acids were also produced directly by the action of sulphuric acid at low or moderate temperatures: below 50° Croceïn acid was formed in a comparatively large proportion, but, as the temperature was raised, the proportion of Schäffer acid increased and the amount of Croceïn acid became very small. In any sulphonation (except with chlorsulphonic acid) two main products were obtained, together with one or more by-products. In the preparation of R. acid there was a mixture of R. and G. acid, but always with a small proportion of the ω-naphthol 3.6.8. trisulphonic acid. The R. acid was fairly easily separated from such a melt, but the separation of the G. and trisulphonic acid was much more difficult.

Methods of Separation

Two methods of separation by arylamines could be followed—*i.e.*, the separation of the free acids or their inorganic salts. In the former case the free arylamines could generally be used, but in the latter case a molecule of acid was necessary. Supposing there was sulphonation so as to obtain R. and G. acids, the melt would also contain the trisulphonic acid but should not contain Schäffer acid. The melt might be limed out in the usual way in order to remove excess sulphuric acid, and a mixture of the Ca. salts of R., G., and the trisulphonic acids was thus obtained. It was not necessary to convert into the sodium salts, which was a considerable advantage, nor even to obtain the Ca. salts in the solid form. A small portion of the solution was then titrated with a diazo solution and the amount of R. acid determined. The theoretical amount of a suitable arylamine was then added, plus a slight excess. According to the conditions the reacting solutions might be either hot or cold. If concentrated solutions were used the solution should preferably be heated, but if comparatively dilute then the solutions might be mixed in the cold, when they were allowed to stand, with or without stirring, until crystallisation took place. The crystalline precipitate was removed in the usual way. It would be found to be the nearly pure normal arylamine salt of R. acid. The mother liquor contained mostly G. acid, and this might be separated either by adding more arylamine and forming the arylamine salt of G. acid, or by evaporating the mother liquor, neglecting the small first precipitate, which was a mixture of the arylamine salts of R. and G. acids.

The authors of the paper stated that they had not yet had time to study exhaustively the separation of G. and the 2.3.6.8. trisulphonic acid. The arylamine salts of the trisulphonic acid were more soluble than those of G. acid, and they did not think there would be any difficulty in their separation by means of a suitable arylamine. In the case of the separation of the free sulphonic acids, an interesting development had ensued which might be of some commercial value. It was quite as easy to separate the free sulphonic acids as their inorganic salts, but they had found that the presence of an excess of sulphuric acid was not very detrimental. It was, therefore, possible to eliminate the liming-out process and yet separate the isomeric sulphonic acids. The sulphonation of *b*-naphthol was extraordinarily complex and much work remained to be done in regard to it. The arylamine salts were extremely useful for the separation of sulphonic acids, and their application in industry was now a question for the industrial chemist.

A paper on "A New Reaction of Certain Diazosulphonates derived from *b*-naphthol-1-Sulphonic Acid. Part I. The Preparation of Phthalazine, Phthalazone and Phthalimidine Derivatives from 4^1-Nitrobenzene-2-Naphthol-1-Diazosulphonate," was presented by F. M. Rowe, E. Levin, A. C. Burns, J. S. H. Davies, and W. Tepper. The authors explained that the compounds formed by the action of sodium carbonate or one molecular proportion of sodium hydroxide on diazosulphonates derived from *b*-naphthol-1-sulphonic acid had been regarded hitherto as diazo-oxides, but in view of a new reaction of certain of these compounds with an excess of sodium hydroxide they would appear to be actually sodium aryl-α-azo-*b*-naphthaquinone-α-sulphonates. All compounds of this type were converted quantitatively by cold dilute acids into the corresponding azo-derivative of *b*-naphthol, but only those derived from diazotised amino-compounds containing a nitro- or an azo-group were sufficiently stable to react further with sodium hydroxide in the new way without decomposition. Further, *b*-naphthol-1-sulphonic acid stood alone in the latter respect.

A New Reaction

Principal attention had been devoted to the elucidation of the reaction which occurred with 4^1-nitrobenzene-2-naphthol-1-diazosulphonate. When a solution of this in aqueous sodium carbonate was added to an excess of cold aqueous sodium hydroxide, the temperature rose and a crimson colour developed immediately, which changed slowly to orange brown. Subsequent acidification gave traces of Para red only, and a yellow compound with the properties of an acid dye could be isolated in excellent yield. It was considered that sodium 4^1-nitrobenzene-α-azo-*b*-naphthaquinone-α-sulphonate was formed by the action of sodium carbonate, and that the ring opened by the addition of NaOH to this, forming an intermediate carboxylic acid, which by rearrangement and closing of the ring gave disodium 3 (4^1-nitrophenyl)-1 : 3-dihydrophthalazine-4-acetate-1-sulphonate. When this was boiled with dilute mineral acid one molecular proportion of sulphur dioxide was evolved and 1-hydroxy-3 (4^1-nitrophenyl)-1 : 3-dihydrophthalazine-4-acetic acid was formed, whose esters, acetate, and anilide had been prepared. Reduction of this acid with alkaline hydrosulphite gave 1-hydroxy-3 (4^1-aminophenyl)-tetrahydrophthalazine-4-acetic acid, which was converted by prolonged boiling with mineral acids into 4^1-amino-3-phenylphthalaz-4-one. The latter was reduced by zinc dust and hydrochloric acid with elimination of ammonia to 4^1-amino-*N*-phenylphthalimidine, from which the known *N*-phenylphthalimidine was prepared.

It appeared possible at first that the new reaction might have given complex *N*-arylimino-derivatives of isoquinoline, and, as the literature contained no reference to compounds of that type, for purposes of comparison *N*-4^1-nitrophenyl-imino-isocarbostyril-3-carboxylic acid was synthesised and found to possess very different properties from those of 1-hydroxy-3 (4^1-nitrophenyl)-1 : 3-dihydrophthalazine-4-acetic acid.

Arsenic in Apples Summons Dismissed

THREE cases were heard at Marylebone Police Court on Tuesday, when the firms involved were J. Barnes and Co., Hampstead, and T. Walton (London), Ltd., of Hampstead and Covent Garden, for selling apples said to contain arsenic to the extent of one-thirtieth of a grain per lb., and A. Billington, of Kilburn, for selling apples with an alleged arsenic content of one-fifteenth of a grain per lb.

The apples concerned were American; English fruit was found to be free. The arsenic was almost entirely confined to the surface of the skin. Two people became ill after eating the apples. Washing the apples, it was stated, would remove 70 or 80 per cent. of the arsenic, but part combined with the proteins in the skin. It was admitted that peeling prevented any risk and that thirty-six apples would have to be eaten, with peel, in a day to give a full medicinal dose of arsenic. The whole affair was admitted to be an accident such as might happen to any trader.

The magistrate dismissed the summons against Barnes and Co. on payment of 20 guineas costs, and dismissed the summons against T. Walton (London), Ltd., and A. Billington on payment of costs of 10 guineas and three guineas respectively.

Bengal Chemical Industries

(From Our Indian Correspondent)

The report of the Industries Department of Bengal for the past year, now published, throws light on the progress made by the chemical industries of the province and the part taken by Government in promoting them. We record here the progress made under the various heads :—

Industrial Research Laboratory

A further advance was made in regard to the scheme framed for the establishment of an industrial research laboratory, where industrial problems relating to the utilisation of raw materials and the manufacture of finished products could be investigated on a semi-manufacturing scale, and industrialists advised in regard to the results of practical experiments carried out. A plan and an estimate amounting to Rs. 50,000 have been prepared, and the scheme has received the administrative approval of Government. It has been decided to locate this laboratory in the compound of the Calcutta Research Tannery in continuation of the main tannery building.

Leather for Army Use

The Superintendent of the Harness and Saddlery Factory, Cawnpore, who was directed by the Ordnance Department to ascertain the capabilities of the local leather industry by reference to the Superintendent, Calcutta Research Tannery, desired that the latter officer should be deputed to Cawnpore in order to survey the requirements and to study the methods of tanning followed in that factory. On his return the Superintendent submitted a scheme for a series of experiments to be conducted at the Calcutta Research Tannery, following the methods of the Cawnpore Harness and Saddlery Factory in the production of leathers of a quality suitable for army requirements which in scope and value are of large dimensions. In addition to this, he has prepared a note describing the detailed processes followed by the harness and saddlery factory in the making of harness leather. This note, together with the samples of leather required for army work, is being circulated among the tanners in Calcutta, with a view to introducing the modern methods of making harness and saddlery leather suitable for army requirements. It is hoped that the results will lead to the supply of a larger proportion of army requirements for manufactured leather from the Bengal tanneries.

Sole Leather from Buffalo Hides

The tannage of sole leather with a mixture of sonali bark (*cassia fistula*), goran bark (*ceriops roxburghiana*) and myrabolans was continued. Sonali was found to be more efficient than babul in toning down the reds of goran. The leather produced from sonali, goran, and myrabolan mixture was of a paler colour than that obtained from babul, goran, and myrabolans.

In addition to the investigations, the Calcutta Research Tannery assisted in the development of the tanning industry by (1) Holding demonstrations on the improved processes of tanning; (2) training of apprentices, and (3) undertaking the machine work involved in finishing leathers for small tanners. Leathers tanned with 35 samples of tanstuffs from different parts of India were sent to the British Empire Exhibition, together with the samples of tanstuffs. Besides these, samples of box sides, glacé kid, lizard skins, and some other varieties of leathers made at the Research Tannery were sent to the Exhibition.

Tannage of Lizard Skins

Ever since the close of the war frequent inquiries have been received from England for the supply of tanned lizard skins from India. With the exception of two tanneries at Cuttack, no other tannery in Northern India has undertaken tannage of lizard skins. In order to introduce this new line among the local tanners, experiments were undertaken to work out a process for tanning and finishing lizard skins using local tanstuffs. From these experiments, a process has resulted for tanning these skins. Some of the lizard skins tanned at the Research Tannery were sent to the British Empire Exhibition at Wembley and attracted the attention of the dealers in fancy leathers in England, as is evidenced by several inquiries recently received. The work also attracted the attention of a few dealers in Calcutta. It appears that the efforts of the Research Tannery have succeeded in opening up an overseas trade in this important line.

Curing of Hides

Soda ash is said to prevent salt stains on hides, if mixed with the curing salt in the proportion of 97 parts salt to 3 parts soda ash. Its effects, when mixed with the imported common salt in the above proportion, were studied last year. But imported common salt is not much used in India in the curing of hides, whereas the Indian khari salt is extensively employed for this purpose. Hence, experiments are being conducted this year to determine the effects of soda ash when mixed with khari salt in the preservation and curing of hides.

Preparation of Pigment Finishes

Pigment finishes were introduced in the dyeing and finishing of leather during the war, apparently on account of scarcity of coal tar dyes at that time. Since then they have been used quite extensively by tanners, because they make the shades of the leather much fuller and more level than when dyes alone are used. In India pigment finishes have not yet come into general use. The chief reason for this is that the finishes are not locally made and supplies are not available locally. Consumers have to import them either from Europe or America, and the finishes being in liquid form and some being even perishable, their import and use are inconvenient and expensive. The Research Tannery has, therefore, undertaken investigation with a view to working out methods of preparing them in this country. An analysis made of one variety of the imported finish has revealed some of the materials of which it is made. These materials have formed the basic ingredients for the preparations that are being made at the Research Tannery. The work is in progress.

Matches

The experiments on the damp-proofing of match composition were continued by the Industrial Chemist during the year. It has been found that identical and comparable results could not be obtained by working with hand laboratory apparatus. Accordingly power-driven laboratory apparatus was imported from England. An Abbe Ball mill, an Atlas Cone mill, and other appliances have been purchased, and it is hoped that systematic results will be forthcoming in the near future. It appears from the researches that the cottage workers in Bengal using hand apparatus for preparing the composition are not likely to succeed in producing the right type of first-class safety matches similar to those manufactured by Sweden. To obviate the difficulty the cottage workers unnecessarily increase the fierceness of the composition. Government have made a special grant of Rs. 3,000 for the purchase of further chemicals and apparatus for successfully carrying on investigations on matches which have been undertaken by the Industries Department.

Glue

Systematic examination of the damp-proofing qualities of the different samples of Continental glue was carried out according to a method discovered by the Industrial Chemist. It has been found that skin glues as a class are most resistant to damp. The results of the examination and the makes of glue which have been found to resist damp best, as also the method of such testing, will be described in detail in a departmental bulletin for the benefit of the public.

Researches on Glass and Sugar

Arrangements have been in progress for the carrying on of systematic researches on the manufacture of glass and sugar. Power-driven and small laboratory units were ordered and obtained. With the starting of the proposed industrial research laboratory systematic researches will be taken in hand.

Dynamite Glycerine for Explosive Purposes

At the instance of the Government of India a scheme for the manufacture of dynamite glycerine, for explosive purposes, was worked out by the Calcutta Soap Works, Ltd., in collaboration with this department. A loan of Rs. 25,000 was subsequently granted to the firm by the Government of India on certain stipulated conditions. With the assistance of the loan and the guidance and advice of the Industrial Chemist, the Calcutta Soap Works, Ltd., have purchased the necessary plant and accessories and installed it at their factory at Ballygunge. The plant was almost ready to commence operations at the close of the year.

Modern Progress in Electrodeposition

First Meeting of New Technical Society

THE first general meeting of the Electroplaters' and Depositors' Technical Society, associated with the Faraday Society, was held at the Northampton Polytechnic Institute, London, on Wednesday, Professor F. G. Donnan being in the chair. A paper on "Electrodeposition: a Survey of Recent Progress," was read by Mr. S. Field, who said that there had of late years been a considerable speeding-up in the progress of the art of electrodeposition, which included extraction, refining and adaption processes. Many new processes had been systematically explored, and the deposition of such metals as tin, lead, iron, cobalt, cadmium, and chromium had been greatly advanced, as also had practical applications. The copper matrices for moulding gramophone records provided a striking example. Deposited metals with steel reinforcement, the production of copper wire, the deposition of copper water jackets, the use of deposited copper for the prevention of carburisation, and, more recently, the deposition of iron and nickel in the repair of worn parts of machinery, were sufficient proof of the extending range of electrodeposition. Properties of deposits needed to be investigated, especially in cases in which the metal deposited was required to withstand mechanical wear. The conditions influencing the hardness of iron, nickel, and copper deposits had recently been investigated by Macnaughton, while Ollard has examined the conditions which make for the adhesion of the deposit. In both cases there were refinements in deposition usually practised in electro-nickelling. The internal stresses in deposited metals had been accredited to the simultaneously deposited hydrogen, which, in an unknown form, was taken up by the deposit. Zinc deposited from acid solutions was a striking example, and there were many remarkable effects which arise from comparatively insignificant causes.

Unsolved Problems

There were, nevertheless, many problems upon which more information was needed; for example, that long-sought "acid-brass" and the deposition of metals on the aluminium vessels. The ever-present problem of spotting out, the use of inert substances in solutions and their desirable limits, the absorption of deposits by die-casting metals, and the throwing power of many solutions are among the numerous problems which might well engage the attention of the research worker. Organised research is now a feature of the activities of many industrial combinations, and the Department of Scientific and Industrial Research has now on hand research work in electrodeposition to which reference is made in the last annual report. The budget of no less than £380,000 for the current year suffices to show the extent of the department's assistance to general industrial research.

The Government and the Dyestuff Industry

IN a communication on this subject, F. Hulse and Co., Ltd., Woodlesford, near Leeds, write:—

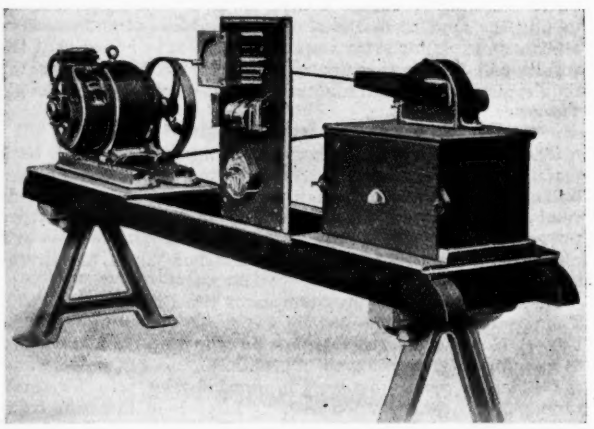
"Although the Government—*i.e.*, the British taxpayer—has given the British Dyestuffs Corporation, Ltd., over one million pounds in addition to large sums for research and big commissions for the sale of reparation dyes, while also affording complete protection under the import prohibition regulations, nevertheless the chairman of the B.D.C. has complained of Government restrictions on their enterprise. These restrictions when analysed amount to a veto against any combination with German makers of dyes, which veto, exercised by the late Labour Government, was supported by almost the unanimous approval of all parties concerned. This should not be forgotten. Lord Ashfield referred at the recent meeting to the freedom enjoyed by other British dyestuff makers, with respect to concluding agreements with Germany, but to be fair he might have stated that no such agreements had been made or even suggested. Why, then, mislead the world at large? . . . Surely the B.D.C. should first honour its obligations to British chemists before taking the easy course of endowing the German. Many men studied chemistry at the Universities because of the promises made of a career for suitably trained men. Instead of appointments, we have witnessed dismissals. Compare also the position of the other dyestuff manufacturers, unaided by subsidy, and think of the boon which a gift of £4,400,000 would have been to them.

"The words of Professor W. H. Perkin, F.R.S., should be recalled and pressed home: 'Failure to develop on research lines is scarcely conceivable if the works is in charge of a highly trained chemical staff, but, on the other hand, if it gets into the power of the business man who wants immediate return for his money outlay, is not willing to wait for results, and fails to appreciate the importance of scientific control, then no tariff can avert disaster.' Also still more germane to the present issue is the declaration of Lord Moulton: 'There is another thing. It must be national in this sense: it must be removed for ever from the temptation of listening itself to the charmer and entering into a combine. We must have a company that is not only powerful, but one the loyalty of which is necessarily beyond all doubt, and that we can only get if it is assisted by the Government, on terms that the Government can stop it from ever entering into the backward path which would ruin its national utility.' Let us then have a real British dyestuffs industry, not a mere appendage of our late enemy. What a travesty of all our boasting!"

Grinding Equipment for the Laboratory

A New Portable Mill

A NEW mill for grinding small quantities of materials on a laboratory scale is described in a pamphlet just issued by A. Gallenkamp and Co., of 19, Sun Street, Finsbury Square, London. The mill is fitted with a feed tray and four sieves, and has an inside diameter of 8 in., its normal speed being 7,500 r.p.m. The equipment is self-contained and includes an electric motor and control panel, as shown in the accompanying photograph, the whole being mounted on a frame. The mill has been introduced to meet the demand for a pulveriser for dealing with small quantities from an ounce to a cwt. at a time, and it is claimed that it can easily be cleaned



when changing from one material to another. The front half of the machine is readily removed, completely exposing the working parts and allowing them to be brushed, wiped or sponged when special cleanliness is necessary.

Almost any dry material can be reduced to a fine powder, varying according to its nature from about one millimetre down to the finest flour, and the perforated steel sieves which regulate the fineness are interchangeable, being fixed by thumb nuts on the underside of the machine. The finished flour passes out through these to the receptacle below, which can take the form of a drawer or box, as illustrated, or a fixing can be placed under the mill to which a small cloth bag can be clasped so that the ground material is delivered direct from the mill into the bag. The power required is from one to two horse power, and an electric motor is the simplest means of driving, though any existing power can be utilised. The mill can be supplied in bronze or other metals when required, and it is stated that the machine can be seen and tested upon request.

Coal Berginisation Developments

State Aid Suggested

A SPECIAL number of the *Transactions* of the Kaiser Wilhelm Gesellschaft, Breslau, has been issued, dealing with recent researches made in the liquefaction of coal. The problem is discussed in a paper in which the conclusion is drawn that the Bergius process offers the best prospect of an economic solution to the problem. The authors, who discuss the question chiefly from the angle of purely scientific research, indicate that the process now needs to be tested on a large scale. They point out, however, that in view of the present financial difficulties there is not much hope of the necessary plant being laid down by private enterprise, and suggest that in view of the importance of the problem from a national point of view the support of the State should be enlisted.

Dr. Lessing's Views

In the course of the third Cantor lecture on "Coal Ash and Clean Coal," delivered at the Royal Society of Arts in London on Monday, Dr. Lessing stated that the direct liquefaction of coal and semi-coke by hydrogenation under pressure has attained a considerable degree of scientific interest, if not commercial importance. In the process as proposed and practised by Bergius, a certain amount of iron oxide is usually added to the coal charged into the autoclave, ostensibly for the purpose of binding sulphur. Bergius recognises that the inorganic constituents have an influence on the liquefaction of coal, and he points out that for their study, which in Germany had not yet received any considerable attention, the solid residue from hydrogenation will be of particular interest as it consists to a large extent, and sometimes exclusively, of the mineral compounds in their original state and unaffected by high temperature reactions. Whilst Bergius does not regard the catalytic influence of inorganic substances as of practical importance, a number of other workers found that certain compounds may exert a profound catalytic effect upon hydrogenation of coal under high pressure, as, indeed, they do in the hydrogenation of fatty oils and hydrocarbons. Fischer found that hydrogen without catalyst gave much poorer results than hydrogen in the presence of sodium carbonate. Recently, Graham studied the effect of a high ash content on the hydrogenation of lignite. The work of Fierz-David and of Bowen, Shatwell, and Nash on the liquefaction of cellulose and coal proved conclusively that the hydrogenation and thermal decomposition at low temperatures of cellulose is subject to very considerable catalytic influence. The synthesis of the liquid hydrocarbons and alcohols from water gas as carried out by the Badische Company and as suggested in Fischer's Synthol process is, of course, entirely based on catalysts, and in the manufacture of the water gas used as raw material the composition of the coke ash or its adjustment is of vital importance in determining the composition and efficiency of production of the gas.

French Tribute to Professor Armstrong

THE leading article in the current issue of *Chimie et Industrie* gives an outline of the careers of the recipients of the gold medal presented annually at the instigation of its president, M. Paul Kestner, by the *Société de Chimie Industrielle* to French and foreign chemists for important scientific research. The first medal was presented in 1921 to Sir William Pope, and this year, it will be remembered, Professor H. E. Armstrong was the recipient. The greater part of his work, the journal states, was devoted to a study of the derivatives of benzene, the important intermediates in the manufacture of dyes, as well as to the causes of colour, and constitutional formulæ. The action of enzymes and other biochemical subjects have also been the subjects of his research.

"His scientific work has never slackened for a single instant since he made his *début* as lecturer in chemistry at the medical school of St. Bartholomew's Hospital, and each year has seen the publication of numerous theses, sometimes the result of his own research, sometimes in collaboration with his many pupils. Member of the Chemical Society since 1870, he was secretary from 1878 to 1893, and president from then till 1895. At the age of 28 he was elected to membership of the Royal Society, of which he later became vice-president, and was presented with the Davy medal. In conjunction with Perry, Ayrton, and Unwin, Professor Armstrong founded the Central Technical College in London, and has always taken great interest in educational affairs, being an active member of the committees of many institutions."

Society of Public Analysts

Magnesium Ammonium Phosphate Determination

AN ordinary meeting of the Society was held at the Chemical Society's Rooms, Burlington House, on Wednesday, December 2, with Mr. S. F. Burford, vice-president, in the chair.

Certificates were read for the first time in favour of Messrs. G. Chignell, K. Saito, and H. G. Watts, and for the second time in favour of Messrs. J. D. Barrett, A. F. Lerrigo, O. A. Mendelsohn, H. E. Monk, and E. Voelcker.

The following were elected members: Messrs. A. Bruce, S. G. Clarke, F. J. T. Grigg, J. Hanley, A. J. Jones, H. W. Lawrence, F. Mattingley, Dr. C. Newcomb, B. F. Sawbridge, and Dr. H. J. Stern.

Abstracts of Papers

In a paper on "Measuring the Smoke Pollution of City Air," by Dr. J. S. Owens, the author discussed the various methods based on (*a*) measurement of deposit from the air, and (*b*) measurement of suspended matter before it is deposited. The methods of the Advisory Committee on Air Pollution were then described under the headings of: (1) Measurement of deposit by means of standard gauges; (2) measurement of suspended impurities by means of automatic filters, or records; and (3) measurement with the author's jet dust counter. The last-named instrument had shown the curious variations in smoke impurities in cities from hour to hour. The excessively minute quantities to be dealt with demand the application of methods more sensitive than those of ordinary analytical processes. For example, the material trapped on dust records from 50 c.c. of air on an average winter's day in London weighed about 1/20,000 mgrm., and consisted of about 600,000 particles.

Dr. O. L. Brady, F.I.C., and Gladys V. Elsmie presented a paper on 2 : 4-dinitrophenylhydrazone as a reagent for aldehydes and ketones, and said that aldehydes and ketones could be identified by the crystalline forms, colours and melting points of the dinitrophenylhydrazones which they yielded with 2 : 4 dinitrophenylhydrazone. A solution of the hydrochloride was a suitable reagent for aldehydes and ketones soluble in water; it gave a filterable precipitate with 0·003 grm. of acetone or acetaldehyde. The characteristics of the 2 : 4 dinitrophenylhydrazones of a number of the commoner aliphatic aldehydes and ketones were described.

Magnesium Ammonium Phosphate

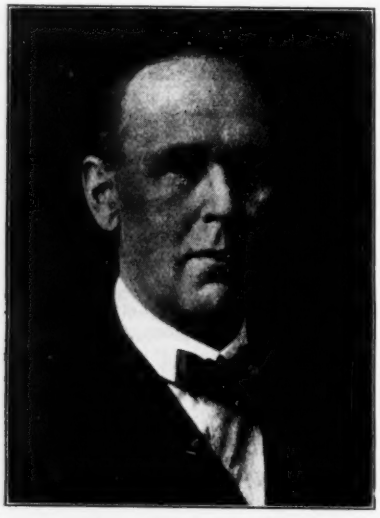
In a paper on the Determination of Phosphoric Acid as Magnesium Ammonium Phosphate, by Dr. Jorgenson, it was stated that the most reliable method of obtaining magnesium ammonium phosphate of the correct composition was to precipitate it from a nearly boiling solution (accuracy about 1 : 1,000). In the author's experience this was the only sufficiently exact method for determining phosphoric acid in mineral phosphates and fertilisers. The author's molybdic magnesium method had been the official Danish method for nearly 20 years. Precipitation of ammonium phosphomolybdate in the cold was less accurate (accuracy about 1 : 100). Precipitation of magnesium ammonium phosphate from a cold solution gave a precipitate so much affected in composition by the conditions of precipitation that the method was unlikely to be made really satisfactory.

Mr. C. H. Thomson read a paper on the Effect of "Blowing on the Composition of Certain Fatty Oils," and stated that the effect of "blowing" on a large scale on the composition, the viscosity and other constants of cottonseed, whale, sperm, and shark oils had been studied. The rise or fall in the values was simultaneous at each stage of the process, but the rates of change were not the same. It was shown that the changes produced by varying the conditions of "blowing" were not comparable, except that the viscosity and refractive index rose simultaneously. None of the oils after "blowing" yielded ether-insoluble bromides.

Death of Professor Edmund Knecht

We regret to record the death, on Tuesday, of Professor Edmund Knecht, Ph.D., F.I.C., M.Sc.(Tech.), Associate Professor of Applied Chemistry at Manchester University and the College of Technology.

Professor Knecht was born in Liverpool in 1861 and took his doctorate at Zürich. In 1884 he was appointed head of the Department of Chemistry and Dyeing at Bradford Technical College. In 1900 he became Chief Lecturer in Chemistry and Dyeing, and in 1902 Professor of Tinctorial Chemistry at Manchester College of Technology.



Professor Edmund Knecht

When the Society of Dyers and Colourists was founded in 1884, Dr. Knecht was appointed editor of the *Journal*, and he retained that position to the present time. He was known personally to a large number of members of the Society, both at home and abroad, and was known all over the world as an authority on colouring matters and the chemical aspects of the textile industries. Last year the Society decided to mark his outstanding service to that body by a testimonial.

Safety First in Chemical Works

In no industry is there more need for protective appliances than in the chemical and allied trades. All these needs are catered for in the wide range of " Evertrusty " Safety Appliances of Wallach Brothers, Ltd., 49, Tabernacle Street, E.C.2, illustrated in their latest *Blue Book of Safety Appliances*. Gas masks are shown and safety helmets with steam, water, fire, acid or oil-proof coverings, together with dust-proof respirators and masks. Of particular interest is a small aluminium respirator with patent automatic outlet valve and a cheap replaceable absorbing medium. The weight is only one ounce. Respirators can be supplied with special filters for the varying risks of poisonous dust, gaseous poisons, vapours and solvents, acid fumes, etc. All types of gloves, guards, goggles, and also asbestos and acid-proof clothing are produced. Safety appliances, such as carboy stands, flexible escapes and extinguishers, are illustrated and first-aid apparatus still further demonstrates the complete range of products for the requirements of the chemical industry.

Chemical Workers' Conference

Owing to unsatisfactory travelling facilities on Friday, December 4, many provincial members were unable to attend the conference between the National Drug and Chemical Union and the Drug and Fine Chemical Manufacturers' Association. In the circumstances the Union decided to refer their applications to the Association, who will report their decisions on them to the Union in due course.

Chemical Matters in Parliament

Gas Mantle Import Duties

Sir P. Cunliffe-Lister (House of Commons, December 3) moved a resolution authorising a duty for five years of 6s. per gross on imported incandescent mantles and 4s. 6d. per lb. on impregnated hose or stockings for use in the manufacture of such mantles.

Sir Henry Jackson said that before the war the Germans had complete control of monazite and the British mantle manufacturers suffered. Now, the great monazite resources of Travancore were controlled by Britain, and this was the source of thorium and cerium. Relying upon the stability of the gas mantle industry mills had been set up to develop thorium and cerium, but they had been affected by the mantle competition and one was out of operation.

The resolution was carried by 175 to 87.

Foreign Capital in Sugar Beet

The Minister of Agriculture (House of Commons, December 7), in reply to Colonel Day, said that the ten sugar beet factories working this season had a nominal share capital of £2,845,000. £2,151,264 had been issued, of which £1,054,100 was owned by other than British investors.

Direct Sale at B.I.F.

Mr. Samuel (House of Commons, December 7), in reply to Lt.-Colonel Moore, said that he was meeting retail representatives in connection with protests against the proposed sale of goods direct to buyers at the British Industries Fair.

British Dyestuffs Corporation

On December 8 numerous questions on this subject were raised in the House, Sir P. Cunliffe-Lister replying to Lt.-Commander Astbury, said that the Dyestuffs Development Committee constituted under the Dyestuffs (Import Regulation) Act was not consulted before the decision to surrender shares and rights to veto was taken by the Government, but the Government was satisfied that they were fully apprised of the views of the various interests represented on the Committee. He was unable to accept the suggestion by Mr. Bethel that the action of the Government would prejudice the interests of other British dye-making concerns. Asked whether the Government would receive a deputation, Sir Philip said that at the proper time the decision could be challenged and they would reply. In reply to Mr. Hurst, he was not aware of any intended amalgamation between the B.D.C. and the German I.G., and it was not proposed to repeal the Dyestuffs (Import Regulation) Act. He was aware that firms other than B.D.C. produced a large proportion of dyestuffs output.

In reply to Mr. Hurst, Sir Philip said that the amount paid or payable to the B.D.C. for commission on sales or Reparation dyestuffs to the end of October, 1925, was £81,800. The Government would not consider the formation of a Select Committee of Inquiry into the recent decision.

Poison Gas Factory at St. Helens

Captain King (House of Commons, December 8), in reply to Mr. Sexton, said that he could not agree to the suspension of notices to quit served on the inhabitants of houses adjoining the poison gas factory. They had had considerable notice and it was unsafe to let them and their children take the risks incurred. It was not proposed to extend the factory, but they were not prepared to remove the factory.

Mines Research Committee Member

Colonel Lane-Fox (House of Commons, December 8), in reply to Mr. C. Edwards, said that no member of the Safety in Mines Research Board was associated with Nobels Explosives Co., Ltd., but the head of that company's research department was rendering valuable service on the Explosives in Mines Research Committee and he had the fullest confidence in his impartiality.

Silk Import Duties

Mr. Churchill (House of Commons, December 8), in reply to Mr. H. Williams, said that import duties on silk and artificial silk up to November 30 had realised £1,081,300.

Lead Poisoning Bill Withdrawn

In the House of Commons December 8, the order of the second reading of the Lead Paint (Protection against Poisoning) Bill was read and discharged. The Bill was withdrawn.

From Week to Week

A NEW ITALIAN CHEMICAL JOURNAL is to be published in January, to be known as *Il Notiziario Chimico-Industriale*. Dr. M. Treves is editor.

EXPERIMENTS FOR THE PRODUCTION OF POWER ALCOHOL from the waste cocoa shell were referred to in a lecture by Mr. A. Churchman to the Birmingham Section of the Society of Chemical Industry on Tuesday.

A TWENTY YEARS' MATCH MONOPOLY in Peru has been obtained by the Swedish Match Co. for £200,000 a year, by agreement with the Peruvian Government. The agreement takes effect as from February, 1926.

SIR WILLIAM EDGE, of W. Edge and Sons, chemical manufacturers, Bolton, has been adopted as Parliamentary candidate for the Bosworth division of Leicestershire. He was M.P. for Bolton for seven years and has been a Junior Lord of the Treasury.

DR. A. W. CROSSLEY, director of the Cotton Research Association, lecturing before the Pharmaceutical Society, London, on Tuesday, said that the annual income of his Association was £54,000, which was totally inadequate. He could not agree that trade research associations were unnecessary or undesirable.

RECENT WILLS INCLUDE :—Mr. W. S. Kinch, of Standish, near Wigan, for 25 years director of the Bradford Dyers' Association, and for many years director of the Clayton Aniline Co., Ltd., £68,432.—Lt.-Colonel Gaskell, one of the original directors of the United Alkali Co., Ltd., £225,254 (net personalty, £196,299).

THE SALE BY AUCTION is announced of the Hadfield Chemical Works, Weston Point, Runcorn, on Thursday, December 17. They include bone charcoal works, ammonia and tar recovery plants, and a new sulphate of ammonia plant. Full particulars are obtainable from Thomas and Lord, 67, Lord Street, Liverpool.

A PROSECUTION against Morrish and Hyde, of Tipton, under the Rag Flock regulations was dismissed on Tuesday on payment of £9 14s. special costs. Flock supplied by them was stated to contain eleven times the permitted amount of chlorine, and the firm had apparently used excess chlorine in their desire for a clean product.

GIVING EVIDENCE before the Coal Commission on Thursday on behalf of Low Temperature Carbonisation, Ltd., Lieut.-Colonel N. G. Thwaites claimed that their "Coalite" smokeless fuel could, when low-temperature carbonisation was widespread, be sold at very much lower rates than many coal charges to-day. Also, he said, half the motor spirit required could thus be obtained, and he was convinced that all coal should be carbonised. He said it was now felt that there were no technical difficulties in the process.

IN THE WINDING-UP COURT on Tuesday, Mr. Justice Romer made an order for the compulsory liquidation of the Vauxhall Chemical Co., Ltd., on the petition of Mr. L. D. Durham, a creditor of the company for £1,200, and the holder of 500 shares, half the capital of the company. Mr. R. Turnbull said the petitioner and another gentleman named Tucker were the only directors and shareholders. Mr. Tucker had gone to America and there was no quorum of directors or shareholders. The affairs of the company were in a hopeless position, and there was no opposition to the petition.

WATER PURIFICATION was the subject of a paper read before the Institution of Water Engineers in London on Friday, December 4, by Dr. J. C. Thresh and Dr. J. F. Beale. By the use of excess lime they were able to make use of the rivers Chelmer and Blackwater for ordinary domestic purposes. Sir Alexander Houston said they all had trouble through the taste of chlorinated water. If they now had a chemical process which would destroy bacilli as efficiently as chlorination without leaving the objectionable taste, it was a big step forward. He agreed that lead was a cumulative poison, and that copper was not, and that therefore the merest trace of lead in water might give rise to lead poisoning in a sensitive person. Mr. W. Paterson said in one case a taste developed in chlorinated water, due to the fact that the roads had just been tarred in the neighbourhood.

SEVERAL ARTIFICIAL SILK developments are recorded, and financial details will be found in our New Companies column. The Kirklees Artificial Silk Manufacturing Co. has issued its prospectus, and will purchase the Twyver Works at Gloucester, and also works at Kirklees, Tottington, near Bury. The viscose process will be followed.—The Nuera Art-Silk Co., Ltd., will erect viscose works in Lancashire. The board is Mr. H. O. Brandt, of H. O. Brandt and Hampson, shippers, Manchester, chairman; Dr. Herbert Levinstein, chemical manufacturer, Manchester; Sir J. W. Paton, of Paton, Calvert and Co., Liverpool; Mr. F. J. Smith, of the British Cotton and Wool Dyers' Association, Ltd.; Mr. J. B. Walker, of Burnet, Walker and Co., yarn merchants, Glasgow; Lt.-Colonel G. A. Wigley, of G. Wigley and Sons (Nottingham), Ltd., silk and cotton merchants. Mr. J. Huebner, F.I.C., is the company's technical adviser.—Mr. E. J. Boake is chairman of the Apex (British) Artificial Silk Co.

THE CONTRACT for the new sugar beet factory at Peterborough has been secured by the Dyer Co., of Cleveland, U.S.A. The cost is £350,000 and work starts next month.

A SMOKE ABATEMENT LEAGUE for the Tyneside was suggested when Professor J. B. Cohen lectured on the subject at Leeds University on Tuesday.

SUFFERING FROM POISONING, W. McNicholl, employed by the Clayton Aniline Co., Bradford, was taken to Ancoats Hospital on Tuesday night, when his condition was serious.

MR. J. T. HAMBLETON, chemist and manager of the Macclesfield Corporation Sewage Department, has been elected chairman of the Council of the Association of Managers of Sewage Disposal Works.

BRITISH FIRMS ARE INVITED to participate in the Chemical Industries Exhibition to be held in Tokio from March 19 to May 17, 1926. Applications must be made this year and full details are available at the Department of Overseas Trade, S.W.1.

A GENERAL MEETING of the Manchester and District Section of the Institute of Chemistry will be held at the Grand Hotel, Aytoun Street, Portland Street, on Monday, December 14, at 7 p.m., when a short address will be given by Dr. H. Levinstein, on some recent activities of the section. An informal social evening will follow at 7.30 p.m.

SEVERAL FIRMS WERE FINED at Manchester on Wednesday for failing to abate a smoke nuisance. These included W. Richardson, Ltd., dyers, Ancoats, £5; J. Lancaster (Manchester), Ltd., dyers, Harpurhey, 40s.; F. Crompton (trading as B. F. Crompton), indigo dyers, Openshaw, 40s.; F. Young and Co., Ltd., bleachers, Blackley, 60s.

E. I. DU PONT DE NEMOURS AND CO. and the National Distillers Products Corporation have formed the Eastern Alcohol Corporation to be jointly owned and operated by them for the manufacture of industrial alcohol. Part of the alcohol will be used by the du Pont Co. in the manufacture of its various products, and the remainder will be marketed by the Kentucky Alcohol Corporation, a subsidiary of National Distillers Products Corporation.

ON BEHALF of the Briton Ferry Chemical and Manure Co., Ltd., in a claim against Richard A. Balfe, of Dublin, Mr. J. Henry, in the Irish Courts on Tuesday, December 1, moved for final judgment for £213 19s., balance claimed to be due by the defendant for goods sold and delivered, and for final judgment for £148 11s. stated to be due on a promissory note. There was no appearance for the defendant, and the Judge granted both motions.

UNIVERSITY NEWS includes the following announcements:—Oxford—Mr. William S. Illingworth, of Oriel College, has been elected to the Gibbs Scholarship in Chemistry. Cambridge—The Special Board of Engineering Studies has appointed Mr. U. R. Evans as assessor in chemistry. Newcastle, Armstrong College—Dr. Henry Stroud has resigned the Professorship of Physics, to take effect from September, 1926, after 39 years' service.

FIRE DAMAGE is reported from various quarters. On Friday, December 4, a fire was extinguished at the chemical works of Cooper, Macdougall and Robertson, after burning for 24 hours. Respirators were worn by the firemen owing to fumes.—Considerable fire damage was caused at the oil, paint, and varnish works of John Hare and Sons, Bristol, on Tuesday.—Three Sunderland bakers collapsed through fumes from coke fire ovens on Monday.

A GENERAL MEETING of the Royal Institution was held on Monday, with Sir J. Crichton-Browne in the chair. The thanks of the members were returned to Dr. W. Rushton Parker for his donation of £100 towards the improvement of the Library. Mr. W. G. Bruty, Dr. P. C. Buck, Mr. J. R. Cousins, Mr. J. Scott Duckers, Mr. A. Edmunds, Mr. M. A. Greig, Mr. E. Marsden, Mrs. Murray, Lieut.- Col. B. C. Quill, Mr. A. L. Reckitt, Miss E. M. Stear, Mr. J. A. Stevenson, and Mr. H. B. G. Warren were elected members. The lecture arrangements for next year were announced. The Juvenile Lectures, the 100th Course, will be delivered by Sir William Bragg on "Old Trades and New Knowledge," commencing on December 29 at 3 o'clock. On Tuesdays, at 5.15, beginning on January 19, there will be two lectures by Dr. J. A. Crowther on X-Rays and Living Matter, two by Dr. E. K. Rideal on Surface Action, two by Dr. Desch on the Growth of Crystals, three by Dr. C. D. Ellis on the Atom of Light and the Atom of Electricity. On Saturday afternoons in the new year there will be four lectures by Sir Ernest Rutherford on the Rare Gases of the Atmosphere and their importance in Atomic Theory. The Friday evening meetings will begin on January 22, when Sir William Bragg will speak on the Work of the Davy-Faraday Research Laboratory.

Obituary

PROFESSOR E. KNECHT (see p. 602).

MR. WILLIAM MACKAY, master of works, United Turkey Red Co., Ltd., Glasgow, on Monday.

MR. JAMES GRANT, M.Sc., F.I.C., F.C.S., Head of the Foodstuffs Department, College of Technology, Manchester, on Monday, aged 66.

COLONEL WILLIAM ROBERT LANG, D.Sc. (Glas.), F.C.S., F.I.C., at Toronto on November 20, director of Military Studies, Toronto University, and formerly of Glasgow.

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REACTIONS.—Action of phenylhydrazine and hydrazine on fats and fatty acids. J. van Alphen. *Rec. Trav. Chim. Pays-Bas*, November, 1925, pp. 1064–1070.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each

Abstracts of Complete Specifications

242,316. Removal of Free Fatty Acids and Other Impurities from Oils, Fats and the Like. Lever Bros., Ltd., Port Sunlight, Cheshire, R. Craig, "Benmore," Bromborough, Cheshire, and C. E. C. Shawfield, "Oakfield," Bromborough, Cheshire. Application date, May 9, 1924.

This process relates to the steam treatment of purified oil in a continuous manner as described in Specification No. 224,928 (see The Chemical Age, Vol. XI, p. 667). The treatment vessel *a* is provided with an inlet *b* and exit *c* for the oil and an

Fig 2

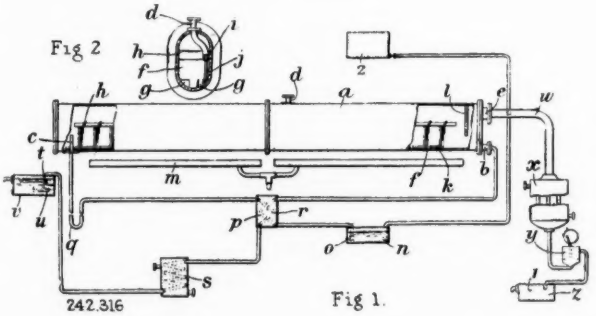


Fig 1.

inlet and outlet *d*, *e*, for the steam. The vessel *a* is divided into a number of compartments by baffles *f* with openings *g* at the bottom, arranged alternately on opposite sides to provide a tortuous path for the oil. The steam passes through a main horizontal pipe *i* having a branch *j* for each compartment, perforated at *k*. The oil as it flows through the compartments in succession is thus subjected to the action of fresh steam. The vessel *a* is heated by gas burners *m* and the operation is conducted at a high degree of vacuum. The oil passes from a tank 2 to a tank *n*, and thence to a heat interchanger *p*, *r*, and the pipe *b* to the vessel *a*. The purified oil passes out through the pipe *c* and trap *o* to the heat interchanger, where it heats the incoming oil. The oil is then drawn off through a water cooler *s* and pump *u*. The volatile products are drawn off through a pipe *w* to a condenser *x*, pump *y*, and receiver *z*. All the external joints are made air-tight and are preferably packed with steam at about 2 atmospheres pressure to prevent inward leakage of air. The steam treatment is effected at 245°–265° C., and the treatment vessel is preferably formed of an alloy containing copper and about 90 per cent. of aluminium.

242,317. Purifying Mineral Oil Products and the Like, Process of. F. Schwarz, 15, Spandauerstrasse, Zehlendorf, near Berlin. Application date, May 9, 1924.

The process is more particularly for treating mineral oils obtained in the kerosene oil and paraffin industries, and the object is to remove the dark coloured constituents without the losses which are involved in the treatment by caustic liquor followed by sulphuric acid. The oil is treated with soap, which dissolves the dark coloured substances, and the soap, together with these substances, are precipitated by means of free alkali. Instead of adding soaps, substances which form soaps with the alkali, such as fatty acids, naphthenic acid, fatty oils, etc., may be added to the oil, with sufficient alkali to saponify these substances. Other additions sometimes employed include salts of organic acids such as benzoic acid, acetic acid, ethyl sulphonic acid, phthalic acid, sulphanilic acid, metanilic acid, α and β-naphthalene sulphonic acids and also salts of inorganic acids such as sodium chloride, sodium sulphate, sodium phosphate, and potassium or magnesium salts. The sludge precipitated by the alkali is filtered off. Reference is directed in pursuance of Section 7, Sub-section 4, to Specifications Nos. 26,198/1904, 16,134/1901 and 9,179/1894.

242,336. Leucite and Other Complex Silicates Containing Potassium, Process for the Treatment of. W. R. Ormandy, 18, Belsize Grove, Belsize Park, Hampstead, London, N.W.3, and A. M. Peake, 319, Clapham Road, London, S.W.9. Application dates, August 2, 1924, and April 29, 1925.

The object is to recover the potash from leucite and to produce compound fertilisers. In the usual treatment of leucite with acid or acid salts, large quantities of aluminium and iron are dissolved with the potassium salt, necessitating the use of three to four times as much acid as would be required by the potassium only, while the subsequent separation of the potassium salts is difficult. In the present invention, leucite is treated with one or more alkaline earth salts of phosphoric acid, calcium carbonate, and dilute sulphuric acid. The whole of the potassium is thus recovered in the form of neutral salts substantially free from iron and aluminium, and most of the insoluble phosphate is converted to a form which is soluble in water or in citric acid and ammonium citrate. Further, the properties and composition of the product as regards the solubility in water or citric acid can be controlled as desired, by controlling the relative proportions of the reacting substances and/or the temperature of the reaction. A water soluble potash product is favoured by increasing the quantity of chalk in the reaction mixture, and a water insoluble but citric acid soluble potash is favoured by decreasing the quantity of chalk. The formation of water-soluble phosphates is favoured by relatively low reaction temperature, and the formation of water insoluble butcitric acid soluble phosphates is favoured by increasing the temperature. The quantity of sulphuric acid required is not more than twice that necessary for the potassium content. The various ingredients are ground and allowed to react without the application of external heat for 24–36 hours. The sulphuric acid may be partly replaced by sulphates such as aluminium sulphate, and when fertilisers are being manufactured, by acid sulphates such as nitre cake. The alkaline earth salts of phosphoric acid may be any mineral phosphates, particularly those containing calcium carbonate; or superphosphate, bone meal, bone ash, etc. If monobasic or dibasic phosphates are used, the quantity of sulphuric acid can be reduced. If a fertiliser is required containing potash and phosphates insoluble in the water, the reaction product may be lixiviated with water to remove the water-soluble constituents. A number of examples are given of the manufacture of various products of different solubilities, showing the effect of different proportions of the ingredients and different temperatures of reaction.

242,464. Vulcanisation of Rubber. S. J. Peachey, 44, Platts Lane, Hampstead, London, and A. Skipsey, Hill Top, White Rose Lane, Woking, Surrey. Application date, December 9, 1924.

This process is an improvement on the method of vulcanising rubber by means of the sulphides of phosphorus described in Specification No. 230,637 (see The Chemical Age, Vol. XII, p. 381). The vulcanised rubber either in solid form or in a dissolved or dispersed condition is subjected to treatment with ammonia, either as gas or in solution. It is found that rubber so treated is superior in strength and tenacity to rubber untreated with ammonia. Rubber solution treated with an insufficient quantity of sulphides of phosphorus to produce gelling under normal conditions may be caused to gel by the addition of ammonia. When vulcanising dipped rubber goods, the rubber coated form is immersed in a solution of sulphides of phosphorus, and subsequently treated with ammonia. Rubber proofed fabrics are treated in a similar manner, and moulded rubber goods are made by moulding a mixture of rubber solution with sulphites of phosphorus, and treating the moulded article with ammonia.

242,512. FERTILISERS, MANUFACTURE OF. Rhenania-Verein Chemischer Fabriken Akt.-Ges., and H. Brenek, Porz b/Koln a/Rhein, Germany. Application date, March 20, 1925.

The process is for the production of alkali dicalcium phosphate for use as a fertiliser. Tricalcium phosphate is heated with silica and sodium carbonate or sulphate to 1,200° C. The quantity of silica used is sufficient for binding one-third of the lime combined with phosphoric acid as ortho silicate, and the quantity of alkali salt is sufficient for replacing the calcium oxide molecule withdrawn from the phosphate complex by alkali oxide. The reaction proceeds according to the following equation:—$2Ca_3(PO_4)_2+SiO_2+2Na_2CO_3=2(Na_2O.2CaO.P_2O_5)+2CaO.SiO_2+2CO_2$. If the natural phosphate contains in addition to tricalcium phosphate other calcium compounds such as calcium carbonate or fluoride, it has been found that lime compounds retard the opening-up action of the heating process. This disadvantage is avoided by adding such a quantity of silica that the calcium which is not present as phosphate is converted into silicate. The silica can be added in the from of sand or as silicate, but is preferably added in the form of phosphorites rich in silicic acid. Suitable proportions between silicic acid and lime can be obtained by mixing phosphorites poor in silicic acid but rich in calcium carbonate, with phosphorites rich in silicic acid. If iron and alumina are present in the phosphorites, these can partly replace silicic acid by the formation of calcium aluminate or calcium ferrite. Some detailed examples of the treatment of crude phosphates are given.

242,521. CROTON ALDEHYDE, PROCESS OF MAKING. E. C. R. Marks, London. From Carbide and Carbon Chemicals Corporation, 30, East 42nd Street, New York. Application date, March 31, 1925.

Croton aldehyde is prepared by the condensation of acetaldehyde to aldol, and decomposition into croton aldehyde and water. $CH_3.CHOH.CH_2.CHO=CH_3CH:CH.CHO+H_2O$. Croton aldehyde usually contains as impurities acetaldehyde, crotonic acid, acetic acid, acetals, and oil or resinous substances, which are detrimental in use, *e.g.*, traces of acetaldehyde are particularly detrimental in the hydrogenation of croton aldehyde to butyr aldehyde and butyl alcohol. In this invention, these impurities are avoided by excluding air during the conversion of aldol to croton aldehyde, and removing the products in a current of steam or inert gas. In an example, aldol is heated under slightly reduced pressure to about 165° C., air being excluded. The aldol is stored in an atmosphere of nitrogen or other non-oxidising gas, which is maintained in the reaction vessel throughout the process. Steam is preferably passed through the mixture to carry off the croton aldehyde. The process may be a continuous one in which aldol is fed gradually into the reaction vessel. The croton aldehyde obtained is fractionated in an inert atmosphere to remove traces of acetaldehyde.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention —224,869 (J. D. Riedel Akt.-Ges.), relating to a process for splitting fats, oils, and waxes, see Vol. XII, p. 86; 229,306 (J. Pieters), relating to the continuous distillation of tar or hydrocarbon oils, see Vol. XII, p. 414; 229,331 (L. Chavanne), relating to a process for gasifying solid fuel, reducing ores, and smelting metals, see Vol. XII, p. 439; 229,334 (Rhenania Verein Chemischer Fabriken Akt.-Ges.), relating to manufacture of chlorine, see Vol. XII, p. 440; 231,159 (International Combustion Engineering Corporation), relating to carbonisation of coal, etc., see Vol. XII, p. 537; 237,574 (Ketoid Co.), relating to method of making acetyl salicylic acid, see Vol. XIII, p. 334.

International Specifications not yet Accepted

240,840. UREA-ALDEHYDE CONDENSATION PRODUCTS. F. Pollak, 20, Langegasse, Vienna. International Convention date, October 1, 1924.

Condensation products of urea and formaldehyde may be converted into the sol state by breaking up and treating in a colloid mill with water. Alternatively, the products may be treated with solvents such as formaldehyde, under the action of heat, with or without a catalyst. Thus, the hardened product may be boiled with 10 per cent. hydrochloric, nitric or sulphuric acid, yielding a solution which precipitates a white substance on cooling. The latter is dried, converted into the sol state by mechanical or chemical means, and may be used for varnishes or converted into the solid state when heating.

240,852. DYES AND PIGMENTS. Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany. International Convention date, October 1, 1924.

A finely divided dry organic or inorganic dye or pigment is obtained by mixing the suspended colour with an alkaline or other solution of a resin or fatty acid, and precipitating by acid. The materials may alternatively be fused together or ground in a colloid mill. The added substance can be removed by solvents, leaving the dye or pigment still in finely divided form. Thus, a paste of a dyestuff obtained from diazotised *m*-nitro-*p*-toluidine and acetoacetic acid anilide is mixed with an alkaline solution of a fatty acid, colophony, copal, or an alkali-soluble phenol-aldehyde resin. The colour is precipitated by hydrochloric acid, filtered, washed, and dried.

240,859. NAPHTHALENE-1 : 4 : 5 : 8-TETRACARBOXYLIC ACIDS. Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany. International Convention date October 2, 1924.

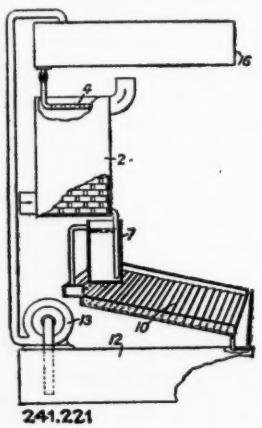
Acenaphthene is condensed with malonyl chloride, in the presence of carbon bisulphide and aluminium chloride. The resulting periacenaphthene-indandione is oxidised with alkaline permanganate to naphthalene-1 : 4 : 5 : 8-tetracarboxylic acid.

240,871. AMMONIA SYNTHESIS. G. Patart, 50, Rue Spontini, Paris. International Convention date, October 6, 1924.

The compressor which compresses the gases for the synthesis of ammonia has its output increased by using the cold produced by the evaporation of the liquid product for cooling the gases. The liquid ammonia may also be used for removing carbon monoxide, water vapour, hydrogen sulphide, etc., from the compressed gases.

241,221. PURIFYING GASES. Koppers Co., 800, Union Trust Building, Pittsburg, Pa., U.S.A. (Assignees of R. A. Morgen, 1855, Clay Street, San Francisco, W. S. Yard, 800, Mandana Boulevard, Oakland, Cal., and L. Rosenstein, 233, 21st Avenue, San Francisco, Cal., U.S.A.) International Convention date, October 11, 1924.

Gas is scrubbed in a tower 2 with sodium carbonate supplied from a tank 16 to a sprayer 4, and a small proportion of



241.221

nickel sulphate is then added to the liquor, producing a fine suspension of nickel sulphide. The liquor passes through a tank 7 and then on to a sluice 10 where it is oxidised by the air with the aid of the nickel catalyst. Sulphur collects on the sluice 10, and is removed, and the regenerated liquor passes to a tank 12 from which a pump 13 returns it to the tank 16.

241,184. ALUMINA. Chemische Fabrik Griesheim-Elektron, 31, Gutleutstrasse, Frankfort-on-Main, Germany. International Convention date, October 13, 1924.

Clay is treated with hydrochloric acid or sulphuric acid and then with sodium chloride. Crude aluminium chloride is obtained, and the iron is reduced to ferrous chloride by means of sulphuretted hydrogen. The solution is sprayed into a tower or rotary tube furnace, into contact with reducing gases, so that the ferrous chloride is not decomposed, but the aluminium chloride is decomposed. The ferrous chloride is dissolved out from the residue with water acidified with hydrochloric acid, and the alumina may then be heated in a current of air containing chlorine or hydrochloric acid to remove the last traces of iron.

LATEST NOTIFICATIONS.

243,665. Distillation of coal. L'Air Liquide, Soc. Anon. Pour L'Etude et L'Exploitation des Procédés G. Claude. November 28, 1924.

243,666. Method of and apparatus for purifying oil. Sharples Speciality Co. November 29, 1924.

243,667. Process for obtaining electrolytic deposits of chromium. G. Le Bris. December 1, 1924.

243,670. Process for converting mercury into another element. Siemens and Halske Akt.-Ges. November 28, 1924.

243,677. Process for the production of sodium bicarbonate and sal-ammoniac. Ges. für Kohlentechnik. November 26, 1924.

243,722. Process for the manufacture of lacquers, impregnating materials and the like. Farbenfabriken vorm F. Bayer and Co. November 26, 1924.

243,735. Process of making soaps and detergents. Colloidal Products Co., Inc. November 25, 1924.

243,736. Continuous process for the manufacture of ether oxides of the fatty series, either simple or combined. Distilleries des Deux-Sévres. November 26, 1924.

243,737. Process of dyeing cellulose esters and ethers. Farbwerke vorm. Meister, Lucius, and Brüning. November 25, 1924.

243,738. Process of dyeing cellulose esters and ethers. Farbwerke vorm. Meister, Lucius, and Brüning. November 25, 1924.

243,739. Manufacture of sulphur dyestuffs. Soc. of Chemical Industry in Basle. November 28, 1924.

243,758. Manufacture of azo-dyestuffs and intermediate products. Farbwerke vorm. Meister, Lucius, and Brüning. November 27, 1924.

243,766. Process for the manufacture of benzimidazoles. Farbenfabriken vorm. F. Bayer and Co. December 1, 1924.

243,768. Manufacture of polymerised styrol and its homologues. Naugatuck Chemical Co. May 7, 1924.

Specifications Accepted with Date of Application

224,522. 2¹-Oxybenzanthrone, Manufacture of. Farbwerke vorm. Meister, Lucius, and Brüning. November 9, 1923.

229,623. Soluble starch products. Process for the manufacture of. Chemische Fabrik Pyrgos Ges., and R. Haller. February 21, 1924.

231,147. Alkali chlorides, Process of effecting the decomposition of. Salzwerk Heilbronn Akt.-Ges., T. Lichtenberger and K. Flor. March 19, 1924.

231,886. Ortho-acetoxy-para-methoxybenzoic acid, Manufacture of. Farbenfabriken vorm. F. Bayer and Co. April 4, 1924.

232,549. Raw materials containing highly refractory oxide, Process for the treatment of. T. R. Haglund. April 17, 1924.

235,552. Ammonium chloride and alkali sulphate, Process for the production of. Continentale Akt.-Ges. für Chemie. June 11, 1924.

237,288. Electrolytic separation of metallic chromium. E. Liebreich. July 21, 1924.

237,567. Preliminary treatment of cellulose prior to esterification. Soc. Chimique des Usines du Rhône. July 28, 1924.

243,046. Solutions containing oxides of chromium, Production of, and the electrolytic separation of chromium from such solutions. E. Liebreich. August 13, 1924.

243,052. Colloid mills, and drying, concentrating, mixing, emulsifying, grinding, and like machines. Rissik, Fraser and Co., Ltd., and A. Fraser. August 16, 1924.

243,075. Leaching processes for the extraction of metals from their ores, and the like. W. G. Perkins, and Metals Production, Ltd. August 22, 1924.

243,081. Titanium pigments, and process of preparation thereof. C. A. Klein and R. S. Brown. August 25, 1924.

243,104. Decomposition of alkali chlorides by steam in the presence of silicates, Process and apparatus for. J. Kersten. September 8, 1924.

243,115. Azo colouring matters dyeing wool fast to milling. British Dyestuffs Corporation, Ltd., J. Baddiley, J. Hill, and A. Riley. September 17, 1924.

243,122. Mixtures of nitrogen and hydrogen for ammonia synthesis, Production of. H. A. Humphrey and Synthetic Ammonia and Nitrates, Ltd. September 24, 1924.

243,123. Adsorptive siliceous material, Method of preparing. F. X. Govers. September 25, 1924.

243,183. Pure alumina, Method of producing. R. Jacobsson. December 16, 1924. Addition to 221,209.

243,192. Superphosphates, Manufacture of. A. C. Hyde. January 19, 1925.

Applications for Patents

Badische Anilin- and Soda-Fabrik and Johnson, J. Y. Means fo removal of materials from high-pressure vessels. 30,207 November 30.

Badische Anilin- and Soda-Fabrik. Preparations for washing and cleaning. 30,584. December 3. (Germany, December 5, 1924.)

Beck, C. W. Apparatus for manufacture of alkali sulphates and hydrochloric acid. 30,727. December 5.

British Enka Artificial Silk Co., Ltd. Preparation of hollow artificial textile fibres from viscose. 30,598. December 3. (Germany, June 11.)

Carpmael, W. (Chemische Fabrik auf Actien, vorm. E. Schering). Manufacture of organic metallic mercaptosulphonic acids and salts thereof. 30,791. December 5.

Chambers and Co., Ltd., F., and Smith, M. Precipitation of dyestuff from solution. 30,201. November 30.

Chemische Fabrik Von Heyden Akt.-Ges. Manufacture of aromatic stibinic acids. 30,712. December 4. (Germany, December 18, 1924.)

Clancy, J. C. Manufacture of hydrocarbons and cyanide. 30,475. December 2.

Coley, H. E. Treatment of ores, oxides, etc. 30,314. December 1.

Continentale Akt.-Ges. für Chemie. Production of fatty acids and oils from waste oils, etc. 30,278. December 1.

Deutsche Erdöl Akt.-Ges. Conversion of heavy into lighter hydrocarbons. 30,610. December 3. (Germany, December 3, 1924.)

Empson, A W. Centrifugal filtering-apparatus. 30,808. December 5.

Esselmann, P., and Legeler, E. Purification of carbon disulphide. 30,364. December 1. (Germany, July 6.)

Farbenfabriken vorm. F. Bayer and Co. Manufacture of benzimidazoles. 30,276. December 1. (Germany, December 1, 1924.)

Farbenfabriken vorm. F. Bayer and Co., and Meerwein, H. Manufacture of halogenated alcohols. 30,332. December 1. (June 11.)

Farbwerke vorm. Meister, Lucius, and Brüning. Manufacture of condensation products of the anthracene series. 30,713. December 4. (Germany, December 4, 1924.)

Gregory, A. W. Treatment of ores for recovery of titanium, tungsten, etc. 30,195. November 30.

Häfele, K. Waterproofing fabrics, etc. 30,601. December 3.

Holmes, A. B. Fixation of chromium salts, etc., on organic fibres. 30,151. November 30.

May and Baker, Ltd. Manufacture of basic bismuth salts of arylarsinic acids. 30,759. December 5.

Naugatuck Chemical Co. Manufacture of polymerised styrol, etc. 30,369. December 1. (United States, May 7, 1924.)

Neill, O. S. Production of oxide of iron and/or alumina from solutions, etc. 30,784. December 5.

Parentani, F. Purification of clay, etc. 30,511. December 2.

Riedel Akt.-Ges. J. D. Manufacture of barbituric-acid derivatives. 30,792. December 5. (Germany, December 6, 1924.)

Soc. Chimique des Usines du Rhône. Preparation of ethylidene diacetate. 30,246. November 30. (France, June 13.)

Soc. of Chemical Industry in Basle. Manufacture of derivatives of pyridine-3-carboxylic acid. 30,793. December 5. (Switzerland, December 20, 1924.)

Stickings, R. W. E. Manufacture of basic bismuth salts of arylarsinic acids. 30,759. December 5.

Synthetic Ammonia and Nitrates, Ltd. Automatic control devices. 30,529. December 3.

Tern, R. Production of fatty acids and oils from waste oils, etc. 30,278. December 1.

Society of Glass Technology

A MEETING of the Society of Glass Technology will be held in the Chemistry Lecture Theatre, University College, London, on Wednesday, December 16, at 2.30 p.m., when the following papers will be communicated:—(1) "The composition of glass suitable for use in automatic machines," by Professor W. E. S. Turner; (2) "The relationship between chemical composition and the durability of glass," by Violet Dimbleby, M.Sc., and Professor W. E. S. Turner.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£20 per ton.
ACID BORIC, COMMERCIAL.—Crystal, £40 per ton, Powder, £42 per ton.
ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.
ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.
BLEACHING POWDER.—Spot, £10 10s. d/d; Contract, £8 10s. d/d, 4-ton lots.
BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.
BORAX, COMMERCIAL.—Crystal, £25 per ton. Powder, £26 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
CALCIUM CHLORATE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d, carr. paid.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 64 O.P.—Industrial, 2s. 5d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE.—4½d. per lb.
POTASSIUM CHLORATE.—3⅞d. per lb., ex wharf, London, in cwt. kegs.
SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.
SODA CAUSTIC, SOLID.—Spot lots delivered, £15 12s. 6d. to £18 per ton, according to strength; 30s. less for contracts.
SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.
SODIUM BICHROMATE.—3½d. per lb.
SODIUM BISULPHITE POWDER 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.
SODIUM CHLORATE.—3d. per lb.
SODIUM NITRATE, REFINED 96%.—£13 5s. to £13 10s. per ton, ex Liverpool.
SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.
SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.
SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.
SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.
SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4½d. to 4¾d. per lb. Crude 60's, 1s. 4d. Little demand.
ACID CRESYLIC 97/99.—1s. 5d. to 1s. 7d. per gall. Pale, 95%, 1s. 4d. to 2s. per gall. Dark, 1s. 4d. to 1s. 9d. per gall. Good demand.
ANTHRACENE PASTE 40%.—3d. per unit per cwt.—Nominal price. No business.
ANTHRACENE OIL, STRAINED.—8d. per gall. Good inquiry. Unstrained, 7d. per gall.
BENZOL.—Crude 65's, 1s. 2d. to 1s. 3d. per gall., ex works in tank wagons. Standard Motor, 1s. 8d. to 1s. 10d. per gall., ex works in tank wagons. Pure, 1s. 11d. to 2s. 3d. per gall., ex works in tank wagons.
TOLUOL.—90%, 1s. 8½d. per gall. More inquiry. Pure, 1s. 11d. to 2s. 2d. per gall.
XYLOL COMMERCIAL.—1s. 10d. to 2s. 3d. per gall. Pure, 2s. 1d. to 3s. 3d. per gall.
CREOSOTE.—Cresylic, 20/24%, 8½d. per gall. Market very quiet. Standard specification, 6¾d. to 7¼d. per gall.; middle oil, heavy, 6¼d. per gall. Market steady.
NAPHTHA.—Crude 9½d. per gall. Solvent 90/160, 1s. 5d. to 2s. per gall. Fair business. Solvent 90/190, 1s. 1d. to 1s. 6d. per gall. Moderate demand.
NAPHTHALENE CRUDE.—Drained Creosote Salts, £3 to £5 per ton. Whizzed or hot pressed, £5 10s. to £6.
NAPHTHALENE.—Crystals and Flaked, £12 to £13 per ton, according to districts.
PITCH.—Medium soft, 50s. to 52s. 6d. per ton, according to district. Market active; prices advanced.
PYRIDINE.—90/160, 20s. per gall. Firmer. Heavy, 9s. 6d. to 10s. per gall. More inquiry.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated.

ACETIC ANHYDRIDE 95%.—1s. 7d. per lb.
ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
ACID ANTHRANILIC.—7s. per lb. 100%.
ACID BENZOIC.—1s. 9d. per lb.
ACID GAMMA.—9s. per lb.
ACID H.—3s. 6d. per lb. 100% basis d/d.
ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.
ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.
ACID SULPHANILIC.—9d. per lb. 100% basis d/d.
ALUMINIUM CHLORIDE, ANHYDROUS.—10d. per lb. d/d.
ANILINE OIL.—7½d. per lb. naked at works.
ANILINE SALTS.—8d. per lb. naked at works.
ANTIMONY PENTACHLORIDE.—1s. per lb. d/d.
BENZALDEHYDE.—2s. 1½d. per lb. Good home inquiry.
BENZIDINE BASE.—3s. 6d. per lb. 100% basis d/d.
BENZYL CHLORIDE 95%.—1s. 1d. per lb.
p-CHLORPHENOL.—4s. 3d. per lb. d/d.
p-CHLORANILINE.—3s. per lb. 100% basis.
o-CRESOL 29/31° C.—3d. per lb. Demand quiet.
m-CRESOL 98/100%.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
p-CRESOL 32/34° C.—2s. 1d. to 2s. 3d. per lb. Demand moderate.
DICHLORANILINE.—2s. 3d. per lb.
DICHLORANILINE S. ACID.—2s. 3d. per lb. 100% basis.
DIETHYLANILINE.—4s. 3d. per lb. d/d., packages extra, returnable.
DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.
DINITROBENZENE.—9d. per lb. naked at works.
DINITROCHLORBENZENE.—£84 10s. per ton d/d.
DINITROTOLUENE.—48/50° C. 8d. to 9d. per lb. naked at works. 66/68° C. 10d. per lb. naked at works.
DIPHENYLANILINE.—2s. 10d. per lb. d/d.
G. SALT.—2s. 2d. per lb. 100% basis d/d.
a-NAPHTHOL.—2s. per lb. d/d. Fair home inquiry.
B-NAPHTHOL.—11d. to 1s. per lb. d/d. Fair home inquiry.
a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d. Fair home inquiry.
B-NAPHTHYLAMINE.—3s. 9d. per lb. d/d. Fair home inquiry.
o-NITRANILINE.—5s. 9d. per lb.
m-NITRANILINE.—3s. 6d. per lb. d/d.
p-NITRANILINE.—1s. 10d. per lb. d/d. Fair home inquiry.
NITROBENZENE.—5¼d. per lb. naked at works. Good home inquiry.
o-NITROCHLORBENZOL.—2s. 3d. per lb. 100% basis d/d.
NITRONAPHTHALENE.—10d. per lb. d/d.
p-NITROPHENOL.—1s. 9d. per lb. 100% basis d/d.
p-NITRO-*o*-AMIDO-PHENOL.—4s. 6d. per lb. 100% basis.
m-PHENYLENE DIAMINE.—4s. per lb. d/d.
p-PHENYLENE DIAMINE.—9s. 9d. per lb. 100% basis d/d.
R. SALT.—2s. 4d. per lb. 100% basis d/d.
SODIUM NAPHTHIONATE.—1s. 9d. per lb. 100% basis d/d.
o-TOLUIDINE.—9d. per lb. Good home inquiry.
p-TOLUIDINE.—2s. 3d. per lb. naked at works.
m-TOLUYLENE DIAMINE.—4s. per lb. d/d.
m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8. Quiet market. Grey, £14 10s. per ton. Liquor, 9d. per gall. 32° Tw.
ACETONE.—£73 per ton.
CHARCOAL.—£7 to £9 per ton, according to grade and locality. Demand fair.
IRON LIQUOR.—1s. 7d. per gall. 32° Tw. 1s. 2d. per gall., 24° Tw.
RED LIQUOR.—10d. to 1s. per gall. 15° Tw.
WOOD CREOSOTE.—2s. 7d. per gall. Unrefined.
WOOD NAPHTHA, MISCIBLE.—5s. per gall. 60% O.P. Solvent, 4s. 6d. per gall. 40% O.P. Very quiet.
WOOD TAR.—£3 15s. to £5 per ton, according to grade.
BROWN SUGAR OF LEAD.—£40 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7½d. to 1s. 5d. per lb., according to quality, Crimson, 1s. 5d. to 1s. 7½d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—2s. per lb.
BARYTES.—£3 10s. to £6 15s. per ton, according to quality.
CADMIUM SULPHIDE.—4s. 4d. per lb.
CARBON BISULPHIDE.—£25 to £28 per ton, according to quantity.
CARBON BLACK.—5½d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£55 to £60 per ton, according to quantity, drums extra.
CHROMIUM OXIDE, GREEN.—1s. 3d. per lb.
DIPHENYLGUANIDINE.—4s. to 4s. 3d. per lb.
INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.
LAMP BLACK.—£43 per ton, barrels free.
LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.
MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.
SULPHUR.—£9 to £11 per ton, according to quality.
SULPHUR CHLORIDE.—4d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£50 to £55 per ton.
THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb.
THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.
VERMILION, PALE OR DEEP.—5s. per lb.
ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, 80% B.P.—£39 per ton ex wharf London in glass containers.
ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 7d. per lb. Keen competition continuing. Good demand.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity.
ACID, BORIC B.P.—Crystal, £46 per ton; Powder, £50 per ton. Carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 4d. per lb., less 5%. Unsettled.
ACID, GALLIC.—2s. 9d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—5s. 6d. per lb. Resublimed, 9s.
ACID, SALICYLIC.—1s. 3d. to 1s. 5½d. per lb. Technical.—10½d. to 11d. per lb.
ACID, TANNIC B.P.—2s. 10d. per lb.
ACID, TARTARIC.—1s. 0½d. per lb., less 5%. Market firm.
AMIDOL.—6s. 6d. per lb., d/d.
ACETANILIDE.—1s. 7d. to 1s. 8d. per lb. for quantities.
AMIDOPYRIN.—12s. 6d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.
ATROPINE SULPHATE.—11s. per oz. for English make.
BARBITONE.—10s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—15s. 9d. to 17s. 6d. per lb.
BISMUTH CITRATE.—13s. to 14s. 9d. per lb.
BISMUTH SALICYLATE.—12s. 9d. to 14s. 6d. per lb.
BISMUTH SUBNITRATE.—13s. 3d. to 15s. per lb. according to quantity.
BORAX B.P.—Crystal, £29; Powder, £30 per ton. Carriage paid any station in Great Britain.
BROMIDES.—Potassium, 1s. 9d. to 1s. 11d. per lb.; sodium, 2s. to 2s. 2d. per lb.; ammonium, 2s. 3d. to 2s. 5d. per lb., all spot.
CALCIUM LACTATE.—1s. 4½d. to 1s. 6d. Market firmer.
CHLORAL HYDRATE.—3s. 5d. to 3s. 6d. per lb., duty paid.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
FORMALDEHYDE.—£41 per ton, in barrels ex wharf.
GLYCEROPHOSPHATES.—Fair business passing. Calcium, soluble and citrate free, 7s. per lb.; iron, 8s. 9d. per lb.; magnesium, 9s. per lb.; potassium, 50%, 3s. 6d. per lb.; sodium, 60%, 2s. 6d. per lb.
GUAIACOL CARBONATE.—6s. to 6s. 6d. per lb.
HEXAMINE.—2s. 4d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 8d. per gallon f.o.r. makers' works, naked.
HYDROQUINONE.—4s. 4¾d. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE B.P.—2s. to 2s. 3d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 1s. 11d. to 2s. 2d. per lb.
MAGNESIUM CARBONATE.—Light Commercial, £33 per ton net.
MAGNESIUM OXIDE.—Light Commercial, £70 per ton, less 2½ %, price reduced; Heavy Commercial, reduced to £23 per ton, less 2½% ; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.
MENTHOL.—A.B R. recrystallised B.P., 42s. 6d. net per lb., December delivery. Synthetic, 22s. 6d. to 27s. 6d. per lb., according to quality. English make. Very heavy demand.
MERCURIALS.—Red oxide, 5s. 2d. to 5s. 4d. per lb.; Corrosive sublimate, 3s. 9d. to 3s. 11d. per lb.; white precipitate, 4s. 6d. to 4s. 8d. per lb.; Calomel, 4s. to 4s. 2d. per lb. Market flat.
METHYL SALICYLATE.—1s. 8d. per lb. Demand increasing, price firmer.
METHYL SULPHONAL.—16s. 9d. per lb.
METOL.—9s. per lb. British make.
PARAFORMALDEHYDE.—1s. 11d. for 100% powder.
PARALDEHYDE.—1s. 2d. to 1s. 6d. per lb., according to quantity.
PHENACETIN.—4s. to 4s. 3d. per lb.
PHENAZONE.—6s. to 6s. 3d. per lb. Spot lower than forward price.
PHENOLPHTHALEIN.—4s. to 4s. 3d. per lb. Supply exceeds demand.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—80s. per cwt., less 2½% for ton lots. Market very firm.
POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb. in cwt. lots. Quiet.
POTASSIUM IODIDE.—16s. 8d. to 17s. 5d. per lb., according to quantity. Steady market.
POTASSIUM METABISULPHITE.—7½d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 7½d. per lb., spot. slightly easier.
QUININE SULPHATE.—2s. 3d. to 2s. 4d. per oz., in 100 oz. tins. Steady market.
RESORCIN.—3s. 9d. per lb. In fair quantities.
SACCHARIN.—51s. 5d. to 53s. 8d. per lb., according to quantity. Limited inquiry.
SALOL.—3s. per lb.
SILVER PROTEINATE.—12s. per lb. for satisfactory product light in colour.
SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.
SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923. 1s. 11d. to 2s. 2d. per lb., according to quantity. Advanced.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£14 to £15 per ton, according to quantity, d/d consignee's station in 1-cwt. kegs.
SODIUM METABISULPHITE CRYSTALS.—37s. 6d. to 60s. per cwt., net cash, according to quantity.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. to 80s. per cwt., according to quantity.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. per lb. Crystal, 1s. 11d. to 2s. 1d. per lb. Very heavy demand.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.
SULPHONAL.—12s. per lb. Limited demand.
THYMOL.—12s. to 15s. per lb. Strong demand.

Perfumery Chemicals

ACETOPHENONE.—9s. per lb.
AUBEPINE (EX ANETHOL).—10s. 3d. per lb.
AMYL ACETATE.—3s. per lb.
AMYL BUTYRATE.—6s. 6d. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—6s. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. 4d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. 4d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 9d. per lb.
BENZYL BENZOATE.—2s. 9d. per lb.
CINNAMIC ALDEHYDE NATURAL.—16s. 9d. per lb.
COUMARIN.—11s. 9d. per lb.
CITRONELLOL.—16s. per lb.
CITRAL.—9s. 6d. per lb.
ETHYL CINNAMATE.—9s. per lb.
ETHYL PHTHALATE.—3s. per lb.
EUGENOL.—10s. per lb.
GERANIOL (PALMAROSA).—22s. 6d. per lb.
GERANIOL.—8s. to 16s. per lb.
HELIOTROPINE.—6s. 3d. per lb.
ISO EUGENOL.—14s. 6d. per lb.
LINALOL EX BOIS DE ROSE.—18s. per lb.
LINALYL ACETATE.—18s. per lb.
METHYL ANTHRANILATE.—9s. 3d. per lb.
METHYL BENZOATE.—5s. per lb.
MUSK KETONE.—40s. 6d. per lb.
MUSK XYLOL.—5s. 9d. per lb.
NEROLIN.—4s. per lb.
PHENYL ETHYL ACETATE.—14s. per lb.
PHENYL ETHYL ALCOHOL.—11s. 6d. per lb.
RHODINOL.—36s. 6d. per lb.
SAFROL.—1s. 4d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—21s. 6d. to 23s. 6d. per lb. Good demand.

Essential Oils

ALMOND OIL.—12s. 6d. per lb.
ANISE OIL.—3s. 9d. per lb.
BERGAMOT OIL.—Supplies uncertain.
BOURBON GERANIUM OIL.—14s. per lb.
CAMPHOR OIL.—60s. per cwt.
CANANGA OIL, JAVA.—11s. 3d. per lb.
CINNAMON OIL, LEAF.—5d. per oz.
CASSIA OIL, 80/85%.—11s. per lb.
CITRONELLA OIL.—Java, 85/90%, 3s. 7d. Business for 1926 supplies at higher prices. Ceylon, 2s. 4d. per lb.
CLOVE OIL.—7s. 3d. per lb.
EUCALYPTUS OIL, 70/75%.—1s. 10d. per lb.
LAVENDER OIL.—French 38/40%, Esters, 28s. per lb.
LEMON OIL.—Supplies uncertain.
LEMONGRASS OIL.—4s. 9d. per lb.
ORANGE OIL, SWEET.—11s. 3d. per lb.
OTTO OF ROSE OIL.—Bulgarian, 60s. per oz. Anatolian, 35s. per oz.
PALMA ROSA OIL.—13s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, no supplies available. Japanese, 25s. 6d. per lb.
PETITGRAIN OIL.—9d. per lb.
SANDAL WOOD OIL.—Mysore, 26s. per lb. Australian, 18s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, December 11th, 1925.

THE market has been comparatively lively during the past week. The general tendency is much more hopeful and confidence is steadily increasing. There are few price changes.

Export trade remains unsatisfactory. There is no doubt that an increasing proportion of the entrepôt trade which was formerly done by this country is passing direct into foreign hands.

General Chemicals

ACETONE is in good demand ; price is firm at £80 per ton ex wharf.

ACETIC ACID has been in better demand and price is firmer in sympathy with acetate of lime. Technical 80% is £37 to £39 per ton and pure 80% at £39 to £41 per ton.

ACID FORMIC is firmer. With the absorption of second hand stocks higher prices are expected. Price to-day is about £50 per ton.

ACID LACTIC is quiet but unchanged at £43 to £44 per ton for 50% by weight.

ACID OXALIC demand has slackened, but the article remains very firm at 3¾d. per lb. to 4d. per lb.

ACID TARTARIC.—The first-hand market is firmer in consequence of the Convention formed between the foreign makers. The demand is very slow, as is usual at this time of the year. Price nominally 11½d. per lb.

ALUMINA SULPHATE is a fairly active market at £5 5s. to £5 10s. per ton for high grade material.

AMMONIUM CHLORIDE.—Price is weak, with very little demand. To-day's quotations are £18 10s. to £19 per ton.

ARSENIC.—It remains to be seen whether the firm tendency will be maintained. The market remains nominal and the future tendency is very uncertain.

BARIUM CHLORIDE is firm and advancing in price. To-day's figure is £9 to £9 10s. per ton.

BLEACHING POWDER is unchanged.

CREAM OF TARTAR is firm and scarce, and higher prices are to be expected. To-day's price is £75 to £76 per ton.

EPSOM SALTS.—Firm and scarce at about £5 15s. per ton.

FORMALDEHYDE.—There are practically no stocks. Spot supplies command £43 to £44 per ton.

LEAD ACETATE is firm at £44 to £45 per ton. The improvement in brown has been maintained at £43 to £44 per ton.

METHYL ALCOHOL.—There is more inquiry about. Makers are very firm in their idea of price, which is about £48 per ton.

LIME ACETATE is firm and scarce at about £18 per ton.

LITHOPONE is unchanged.

POTASSIUM CARBONATE is unchanged at about £23 per ton.

POTASSIUM CHLORATE is in moderate demand at 4d. per lb.

POTASSIUM PERMANGANATE.—There is little more inquiry, with stocks offering at 7½d. per lb.

SODIUM ACETATE is firm and scarce. Price is higher at £18 10s. per ton.

SODIUM BICHROMATE is an active market. Price unchanged at 3½d. per lb.

SODIUM NITRITE is in fair demand, price £22 10s. per ton.

SODIUM PRUSSIATE is a firm market at 4½d. per lb.

SODIUM SULPHIDE is weak and uninteresting.

ZINC SULPHATE is unchanged.

Coal Tar Products

There is little change to report in the market for coal tar products from last week.

90% BENZOL is firm at 1s. 10d. per gallon on rails. Supplies over January-March are well bought up, and indications are that the price will rise further.

PURE BENZOL is quoted at 2s. 1d. to 2s. 2d. per gallon on rails.

CREOSOTE OIL is unchanged, at 6½d. per gallon on rails in the north, while the price in London is 7½d. per gallon.

CRESYLIC ACID is unchanged, the pale quality 97-99% being quoted at 1s. 10d. to 1s. 11d. per gallon on rails, while the dark quality 95/97% is worth 1s. 5d. to 1s. 6d. per gallon on rails.

SOLVENT NAPHTHA is steady at 1s. 5d. per gallon on rails.

HEAVY NAPHTHA is worth 1s. 1d. per gallon on rails.

NAPHTHALENES are unchanged, with no great demand, the lower grades being worth from £4 to £4 10s. per ton, the 76/78 quality about £6 per ton, and the 74/76 quality about £5 10s. per ton.

PITCH is firm and prices show a further increase. To-day's value is approximately 47s. 6d. to 50s. per ton f.o.b. U.K. ports, although business has been reported in certain quarters at 52s. 6d. per ton f.o.b.

Latest Oil Prices

LONDON.—LINSEED OIL closed steadier at 5s. to 12s. 6d. decline. Spot quoted £36 15s., with December to August, £35 7s. 6d. RAPE OIL quiet. Crude, crushed, £48 10s. ; and technical refined, £51 10s. COTTON OIL quiet. Refined common edible, £44 ; Egyptian crude, £37 ; and deodorised, £46. TURPENTINE steady at 2s. decline. American, on the spot, 68s. ; January-April, 69s., sellers, after 69s. 3d. to 68s. 6d. taken.

HULL.—LINSEED OIL.—Naked, spot and December, £36 5s. ; January-April, £36 ; and May-August, £35 10s. COTTON OIL.—Naked Bombay crude, £34 ; Egyptian crude, £36 5s. ; edible refined, £39 10s. ; and technical, £38. PALM KERNEL OIL.—Crushed, naked, 5½ per cent., £43 10s. GROUNDNUT OIL.—Crushed, extracted, £44, and deodorised, £48. RAPE OIL.—Extracted and crushed, £47 10s. per ton. CASTOR OIL.—Spot, pharmaceutical, in barrels, 52s. to 54s. ; firsts, 47s. to 49s., and seconds, 44s. to 47s. per cwt. COD OIL, in barrels, 31s. to 32s. 6d. per cwt.

Nitrogen Products Market

Export.—During the last week the demand for sulphate of ammonia has been exceptionally quiet, and as continental producers are offering at comparatively cheap prices, British producers have made very small sales. It is expected that a heavy demand will set up after the turn of the year, and that the present price of £12 5s., f.o.b., in single bags will be raised.

Home.—Home prices have now been announced for delivery up to the end of May, as follows :—December, £12 13s. per ton ; January, £12 15s. per ton ; February, £12 18s. per ton ; March/May, £13 1s. per ton, for neutral quality basis 21·1% nitrogen delivered in 4-ton lots to consumers' nearest station. Since the publication of these prices considerable home orders for forward periods have been forthcoming.

Nitrate of Soda.—The nitrate market also continues quiet with prices unchanged.

American Market Movements

(From *Drug and Chemical Markets*)

PRICE changes in heavy chemicals are few and unimportant. Barium salts show no improvement. Aqua ammonia is unchanged. Copper sulphate remains easy. Para-nitroaniline competition has been met by leading makers at 53c.lb. Benzidine base and dimethylaniline remain unsettled. Pyridine is lower. Cresylic acid has advanced. Phenol and naphthalene are firm. Light oils occupy unchanged positions.

Routine buying continues in the fine chemical market with very little market activity. Continued high prices for quicksilver have caused an advance in the mercurials and manufacturers have announced an advance in vanillin. Menthol continues to decline. Thymol is firm.

Market for Fertilisers in Esthonia

ACCORDING to the Esthonian Central Statistics Bureau, imports of fertilisers during the first nine months of this year considerably exceeded those for the whole of 1924. The bulk of the imports came from Germany, Sweden, Belgium, and Denmark. The following are the quantities of the chief imports during the period under review, together with the comparative figures, but the continued expansion would appear to offer scope for British producers :—

Commodity.	1925. Jan.-Sept. (9 months only)	1924.	1923.
	Tons.	Tons.	Tons.
Thomas phosphate ..	4,400	2,467	87·5
Superphosphate	24,465	14,639	861
K_2O salt	4,881	3,545	112
Chile saltpetre	844	254	7·5

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, December 11, 1925.

BUSINESS in the heavy chemical market remains fairly active, good inquiry being received both for prompt and future delivery.

There are no important changes in prices to record.

Industrial Chemicals

ACID ACETIC 98/100%.—In usual steady demand. Quoted £55 to £67 per ton, according to quality and packing, c.i.f. U.K. port; 80% pure, £40 to £41 per ton; 80% Technical, £38 to £39 per ton, packed in casks c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated, or small flaked, £40 per ton. Powdered, £42 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Still in poor demand and price unchanged at about 4½d. per lb. delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. Crystals.—Unchanged at about 1s. 3¾d. per lb., less 5% ex wharf, in moderate demand.

ACID FORMIC 85%.—Still higher quotations from the Continent. Now quoted £48 per ton, ex wharf.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC 80°.—Remains unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—Spot material quoted 3¾d. per lb., ex wharf. Could be obtained slightly cheaper for prompt shipment from the Continent.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC B.P. CRYSTALS.—Steady demand and price unchanged at about 11½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE, 17/18% IRON FREE.—On offer from the Continent at about £5 10s. per ton c.i.f. U.K. ports. Spot material available at £6 5s. per ton, ex store.

ALUM, LUMP POTASH.—Quoted £7 15s. per ton c.i.f. U.K. ports. Spot material available at about £9 2s. 6d. per ton, ex store. Powdered quality offered from the Continent at £7 12s. 6d. per ton c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—In moderate demand and price unchanged at 1s. 4½d. per lb., less 5% ex station. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton; packed in 5 cwt. casks delivered U.K. ports.

AMMONIA LIQUID 880.—In usual steady demand and price unchanged at 2½d. to 3d. per lb. delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £26 per ton to £27 per ton, ex station. An offer from the Continent at about £22 10s. per ton c.i.f. U.K. ports. Fine white crystals quoted £18 15s. per ton c.i.f. U.K. ports, prompt shipment from the Continent.

ARSENIC, REFINED WHITE CORNISH.—Price remains unchanged at about £17 10s. per ton, ex wharf. Prompt shipment from works. Spot material available at about £19 per ton, ex store.

BARIUM CHLORIDE.—Large white crystals quoted £9 per ton, ex store, spot delivery. On offer from the Continent at about £7 15s. per ton c.i.f. U.K. ports. Fine white crystals, £7 5s. per ton c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton c.i.f. U.K. ports.

BLEACHING POWDER.—English material unchanged at £9 10s. per ton, ex station. Contracts 20s. per ton less. On offer from the Continent at about £7 15s. per ton c.i.f. U.K. ports.

BORAX.—Granulated, £24 10s. per ton. Crystals, £25 per ton. Powdered, £26 per ton. Carriage paid U.K. stations.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, carriage paid U.K. stations. Continental slightly cheaper at about £3 10s. per ton c.i.f. U.K. ports.

COPPERAS, GREEN.—In good demand for export. Price unchanged at about £3 7s. 6d. per ton f.o.b. U.K. ports, packed in casks.

COPPER SULPHATE.—English material for export quoted £24 per ton f.o.b. U.K. port. Continental on offer at about £22 per ton, ex wharf.

FORMALDEHYDE 40%.—Rather higher quotations from the Continent. Now quoted £40 per ton c.i.f. U.K. ports. Spot material still available at £41 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental on offer at about £3 per ton c.i.f. U.K. ports.

LEAD ACETATE.—White crystals offered from the Continent at about £43 5s. per ton c.i.f. U.K. ports. Spot material quoted £45 5s. per ton, ex store.

LEAD, RED.—Imported material unchanged, £43 10s. per ton, ex store.

LEAD, WHITE.—On offer from the Continent at about £43 per ton, ex wharf. Spot material quoted £44 per ton, ex store.

MAGNESITE, GROUND CALCINED.—In moderate demand and price unchanged at about £8 15s. per ton, ex station.

POTASH CAUSTIC.—88/92%.—Syndicate prices vary from £25 10s. to £28 15s. per ton c.i.f. U.K. ports, according to quantity and destination. Spot material available at about £29 per ton, ex store.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb. delivered.

POTASSIUM CARBONATE 96/98%.—Quoted £25 10s. per ton c.i.f. U.K. ports. Prompt shipment from the Continent. Spot material available about £27 per ton, ex store.

POTASSIUM CHLORATE 98/100%.—Limited quantities available for prompt shipment from the Continent at about £30 per ton c.i.f. U.K. ports.

POTASSIUM NITRATE, SALTPETRE.—Rather cheaper quotations for forward delivery. Quoted about £24 to £24 10s. per ton c.i.f. U.K. ports. Spot material offered at £27 per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Spot material quoted 8d. per lb., ex store. Offered for early delivery at 7½d. per lb., ex wharf.

POTASSIUM PRUSSIATE YELLOW.—In good demand and price unchanged at about 7¾d. per lb., ex store. Offered for prompt shipment from the Continent at about 7½d. per lb., ex wharf.

SODA CAUSTIC, 76/77%.—£17 10s. per ton; 70/72%, £16 2s. 6d. per ton; broken, 60%, £16 12s. 6d. per ton; powdered, 98/99%, £20 17s. 6d. per ton. All carriage paid U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—On offer at about £18 5s. per ton, ex store, spot delivery. Quoted £17 15s. per ton, c.i.f. U.K. ports, prompt shipment.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—English price unchanged at 3½d. per lb., delivered.

SODIUM CARBONATE, SODA CRYSTALS.—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, £1 7s. 6d. per ton more. Alkali, 58%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture unchanged at £9 10s. per ton, ex station, minimum ton lots. Pea crystals, £14 per ton, ex station. Continental commercial quality quoted £9 5s. per ton, ex store. On offer from the continent at £8 10s. per ton, c.i.f. U.K. ports.

SODIUM NITRATE.—Quoted £13 pre ton, ex store; 95/98% refined quality, 7s. 6d. per ton extra.

SODIUM NITRITE, 100%.—Quoted £24 per ton ex store. Offered from the continent about £22 5s' per ton, c.i.f. U.K. ports.

SODIUM PRUSSIATE, YELLOW.—Still in good demand and price for spot material now about 4¾d. per lb., ex store. On offer from the continent at 4½d. per lb., ex wharf.

SODIUM SULPHATE, SALTCAKE.—Price for home consumption, £3 10s. per ton, f.o.r. works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE, 60/65%.—Solid, £13 5s. per ton; broken, £14 5s. per ton; flake, £15 5s. per ton; crystals, 31/34%, £8 12s. 6d. per ton. All delivered buyers works, U.K. minimum 5-ton lots, with slight reduction for contracts; 60/62% solid quality offered from the continent at about £10 10s. per ton, c.i.f. U.K. ports. Broken £1 per ton more. Crystals, 30/32%. £7 10s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £10 10s.; roll, £9 10s.; rock, £9 7s. 6d.; ground, £9 5s, per ton, ex store, spot delivery. Prices nominal,

ZINC CHLORIDE.—British material, 96/98%, quoted about £24 per ton, f.o.b. U.K. ports; 98/100% solid on offer from the continent at about £22 10s. per ton, c.i.f. U.K. ports. Powdered about 20s. per ton extra.

ZINC SULPHATE.—Of continental manufacture on offer at about £11 15s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

NAPHTHIONATE OF SODA.—1s. 8d. to 1s. 9d. Some home inquiries.

ALPHA NAPHTHYLAMINE.—2s. to 2s. 1d. Some home inquiries.

ALPHA NAPHTHOL.—1s. 2d. to 1s. 3d. Some home inquiries.

H. ACID.—3s. 6d. per lb. Few home inquiries.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, December 11, 1925.

The improved tone of the chemical market, which has been a welcome feature of Manchester trade for the last month or so, is still in evidence this week. With the end of the year approaching and the Christmas recess quieter conditions may be looked for, but several firms express the view that the opening of the New Year will see a continuation of the better business. The issue of the final United States Bureau report on Tuesday more or less stabilises the position as regards the available supply of raw cotton and should react favourably on the chemical-consuming textile industries. As to values these are keeping up pretty well all round.

Heavy Chemicals

Chlorate of soda keeps steady at round 2¾d. per lb. and a fair volume of inquiry has been met with. Saltcake is on offer at from £3 10s. to £3 12s. 6d. per ton, but the demand for this material is rather slow. Glauber salts are quiet at £3 5s. to £3 10s. per ton. Business in bichromate of soda has been fair at round 3¼d. per lb. Soda crystals are well held at about £5 5s. per ton and transactions are on a moderate scale. A quietly steady demand for caustic soda is being experienced at firm prices, ranging from £15 12s. 6d. per ton for 60 per cent. material to £18 for 76-77 per cent. Acetate of soda is still quoted at round £17 10s. per ton but sales are on the slow side. Bleaching powder meets with a fair amount of inquiry at about £9 per ton. Hyposulphite of soda is quiet and values are easy though not quotably changed from last report; commercial quality is quoted at about £9 and photographic crystals at £14 per ton. Alkali is steady and in good request at round £6 15s. per ton. Phosphate of soda is not attracting very much attention and current values are about £12 5s. per ton. Prussiate of soda is in moderate request and prices are maintained at 4d. per lb. Sodium sulphide, 60-65 per cent. concentrated solid, is on offer at £11 10s. per ton and commercial quality at about £9 10s., but buying interest is rather restricted. Bicarbonate of soda is fairly steady though not too active at £10 10s. per ton.

Values of yellow prussiate of potash are firm at 7¼d. to 7½d. per lb. and demand is fairly good. Caustic potash is a shade more active than it has been and prices are better, 90 per cent. quality quoting at round £28 10s. per ton. Carbonate of potash is steady both as to price and demand, 96-98 per cent. quality bringing £25 10s. to £26 per ton. In chlorate of potash a fair amount of business is being done at about 4d. per lb. Permanganate of potash is moderately active and quotations are steady; B.P. quality is offering at 7½d. to 7¾d. per lb., and commercial at 5¾d. to 6d. Bichromate of potash is in moderate request at 4½d. per lb.

Sulphate of copper is still quoted at £24 to £24 10s. per ton, but the demand for this material is rather slow. Arsenic is also in quiet demand and prices still hover round £15 per ton on rails for white powdered, Cornish makes. Nitrate of lead is steady and is selling in moderate quantities at £40 to £41 per ton. A quietly steady business in acetate of lead is being put through and prices are held, white material being quoted at £44 to £45 per ton and brown at round £40. Acetate of lime meets with a fair amount of inquiry at recent levels; grey is on offer at £15 to £15 10s. per ton and brown at about £8.

Acids and Coal Tar Products

A quiet demand for acetic acid has been experienced and values are about unchanged at £38 per ton for 80 per cent. commercial material and £67 for glacial. Oxalic acid is a little more active and quotations are steadier at round 3¾d. per lb. Citric acid is unaltered since last week at 1s. 3¼d. to 1s. 3½d. per lb. but sales are rather limited. Tartaric acid is also on the quiet side at round 11½d. per lb.

Pitch prices are firmer at about 47s. per ton and more buying interest is being shown. Carbolic acid continues dull and weak at 4¼d. per lb. for crystals and 1s. 3d. to 1s. 4d. per gallon for crude material. Solvent naphtha is quiet but fairly steady at 1s. 5½d. per gallon. Creosote oil is in moderate demand at about 6d. per gallon. A quietly steady inquiry for crude naphthalenes has been met with at from £4 per ton; refined is on offer at round £13.

Tariff Changes

Switzerland.—The following rates, under the Chemicals, etc., section of the Tariff are imposed and will come into force at a date to be fixed :—

Articles.	Rate of Customs Duty. Present.	Fixed by Decree.
	Frs. per 100 kilogs. (gross weight)	Frs. per 100 kilogs. (gross weight)
Caustic potash and caustic soda, solid	1·50	2
Chloride of magnesium	0·30	0·50
Carbide of calcium	0·50	5
Inorganic prepared auxiliary materials for industrial use not specified in the Tariff, except citrate of calcium	3	5
Methyl alcohol; collodion; organic combinations of bromine, chlorine, and iodine; phosgene; other similar products not specified in the Tariff	3	5
Derivatives of tar oil	1	2
Aniline, anthracene, naphthalene and coal tar colours (not including artificial alizarine) not specified in the Tariff	20	30
Natural or artificial indigo; indigo solution	10	15
Varnishes, lacs, and siccatives	40	50
Common soap	20	25
Other soap of all kinds	90	120

Peru.—A special tax of 2 centavos per 100 kilogs is levied on all goods loaded or discharged at the port of Salaverry.

Australia.—The duty imposed on citric acid under the recent new tariff, will not take effect until April 1, 1926.

Czechoslovakia.—The following articles may now be imported without licence :—Degras and oleic acid, fatty oils, ochre, essential oils, artificial silk, aluminium, technical ware, caustic potash (solid lye), arsenic trioxide, peroxide of hydrogen, nitric acid, pyroligneous acid (crude), sulphite, bisulphite, and hyposulphite of lime in aqueous solution, citrate of lime (crude), barium chloride, hydrochlorate of alumina.

Portugal.—The following export duties are now imposed: —Spirits of turpentine, ·3 cts. per kilog; kaolin, 4 esc. per metric ton; glues, ·2 cts. per kilog; sulphate of copper and superphosphates, 5 cts. per metric ton; pyrites, 2 cts. per metric ton.

Poland.—The export of crude oil is now permitted.

Lithuania.—Export duty on linseed oil of less than 95 per cent. purity is now 5.50 lits per 100 kilogrammes. For a purity of 95 per cent. or over there is no duty.

Poland.—Amendments in Tariff rates, which are not given in detail, affect the following goods—glue, gelatine, glass, vitriols, vegetable fatty oils and glycerine, soaps, varnish, and colours. The duties are reduced for unworked animal fat, bituminous wax, bicarbonate and chlorate of soda and potash, and tanning extracts.

Soviet Union.—The duty-free importation of cement is allowed for countries which impose no import duty on Soviet cement.

Roumania.—New export duties are—Cement and plaster of paris, 100 lei per wagon; ultramarine, 5 lei per 100 kilogs.

Dyestuffs Licences for November

The following statement relating to applications for licences under the Dyestuffs (Import Regulation) Act, 1920, made during November, has been furnished to the Board of Trade by the Dyestuffs Advisory Licensing Committee: The total number of applications received during the month was 682, of which 579 were from merchants or importers. To these should be added 34 cases outstanding on October 31, making a total for the month of 716. These were dealt with as follows: Granted, 579 (of which 550 were dealt with within seven days of receipt). Referred to British makers of similar products, 76 (of which 53 were dealt with within seven days of receipt). Referred to Reparation Supplies available, 5 (all dealt with within two days of receipt). Outstanding on November 30, 1925, 38. Of the total of 716 applications received 608, or 85 per cent., were dealt with within seven days of receipt.

Company News

PARTINGTON STEEL AND IRON.—The directors announce that the dividend on the preference shares due on January 1 will not be paid.

ANGLO-AMERICAN OIL CO., LTD.—The directors have declared an interim dividend of 1s. 6d. per share, free of tax, on the ordinary shares.

AMERICAN CYANAMID.—A dividend of $1¼ per share has been declared on the preferred stock, and $1 per share, plus $¼ extra, on the common stock, payable on January 2.

EGYPTIAN SALT AND SODA CO.—The accounts for the year ended August 31 show a net profit of £E20,443. A dividend of 5 per cent. is proposed, carrying forward £E40,966.

ARIZONA COPPER.—At an extraordinary general meeting held in Edinburgh on December 2 it was resolved to reduce the capital to £395,000 by the return of the capital represented by the preference stock.

JOSEPH NATHAN AND CO., LTD.—The net profits for the year ended September 30 were £50,365 and £18,831 was brought forward. It is proposed to pay the dividend on the A preference shares, and to carry forward the surplus.

HUELVA COPPER AND SULPHUR MINES.—For the year ended June 30 last the report states that the mining profit was £77,047, as against £66,377 in the previous year. The directors have written off for depreciation £39,616, leaving £37,430, less expenses and taxes, £5,204, and loss on exchange, £12,201, leaving £20,024. After adding balance brought forward and paying a dividend of 1s. per share, there is a balance of £10,199 to be carried forward.

MAJOR AND CO.—The report for the year ended March 31, 1925, states that the balance of profit and loss appropriation account brought forward is £9,650, to which is added for the past year £14,309, making £23,959. Dividends for the year have been paid on the 6 per cent. cumulative preference and on the 8½ per cent. cumulative preference shares, and the directors recommend that the balance of £12,459 be carried forward. The directors regret that they do not see their way to recommend payment of dividends on the preferred ordinary and ordinary shares.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

BITUMINOUS PAINTS, RED LEAD, ETC.—A reliable agency firm in Stockholm wishes to represent British manufacturers of bituminous paints, red lead (dry and mixed with oil), oxide of iron, dry colours for paint manufacture, asbestos and products thereof, non-ferrous metals in ingots, pig iron, and china clay. (Reference No. 637.)

SALT.—A commission agent in Copenhagen desires to represent British exporters of salt. (Reference No. 663.)

CHEMICALS.—The Direction Générale of the Roumanian State Monopolies are inviting tenders for the supply of various chemicals. Further particulars on application. (Reference B.X.2196.)

ARTIFICIAL SILK.—A Bombay firm desires the Indian representation of British artificial silk producer (Reference 653); and a Christchurch agent desires a similar agency for New Zealand (Reference 656).

CHEMICALS AND CEMENT.—A firm in Atlanta, Georgia, desires to represent British exporters of above. Agency arrangements on a commission basis.

PORTLAND CEMENT.—Tenders are invited for supply of Portland cement (300-400 tons per month) for Edinburgh Corporation, and should be sent to Mr. A. S. Grierson, City Chambers, by December 21.

TAR, OILS, ETC.—Tenders are invited for the supply of tar and bituminous preparations, oils and petrol for Gloucester Council, and should be sent to the County Surveyor by January 1.

PAINTS, ETC.—Tenders are invited for the supply of paints, oils, Portland cement, hydraulic lime, to be sent to the Chairman of the Council, Pentre, by December 28.

TAR, DISINFECTANTS, ETC.—Tenders are invited for the supply of lime, cement, disinfectants (carbolic acid and powder) and distilled tar to the Clerk of Southall Council by January 12.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to January 9, 1925.

"EFFICYL."

462,661. For chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives, but not including compositions for the prevention and removal of incrustation in steam boilers, and not including any goods of a like kind to these excluded goods. Class 1. Badische Anilin and Soda Fabrik (a Joint Stock Company organised under the laws of Germany), Friesenheimerstrasse, Ludwigshafen-on-Rhine, Germany; manufacturers of alizarine aniline dyes, artificial indigo and chemicals. (To be Associated. Sect. 24.) September 25, 1925.

"COON."

461,019. For carbon black for use in manufactures. Class 1. Typke and King, Ltd., Crown Chemical Works, Commonside East, Mitcham Common, Surrey; chemical manufacturers. July 28, 1925.

New British Chemical Standard

THE recent issue of a standard iron ore sample resulted in several requests for a manganese ore prepared on similar lines. The organisers of the British Chemical Standard movement now announce that such a standard is ready for issue, together with a preliminary certificate of analyses by thirteen different chemists representing independent analysts, sellers (mine owners), and buyers (ferro-manganese, iron, and chemical manufacturers) to whom the standard will particularly appeal. The average analysis is as follows:—

MANGANESE ORE "A"
(Dried at 100-110 deg. C.)

Manganese	51·3
Available Oxygen	14·3
Iron	1·3
Silica	6·5
Phosphorus	0·22

The standard is available to anyone at a price based on covering the cost of preparing and issuing it. The three usual sizes of 50 g., 100 g., and 500 g., are available and the usual certificate is furnished with each sample. In a later edition an outline of the methods employed will be included and sent on request in exchange for the preliminary edition. Further particulars may be obtained from 3, Wilson Street, Middlesbrough.

New Book on Smoke Abatement

THE Smoke Abatement League of Great Britain has just issued its sixth report, from which one important fact emerges: the League is hampered by lack of funds, and its activities are curtailed accordingly. Apart from lectures, exhibits, and organised demonstrations a film has been suggested for propaganda, and the League has made arrangements with Ernest Benn, Ltd., to publish a handbook on domestic smoke. Publications on industrial smoke and noxious fumes are also anticipated, and a monthly bulletin will be issued when funds permit. A library is being formed. The League is of the opinion that a new Bill is very desirable and supports the Coal Smoke Abatement Society on that point. The report states that the conference at Manchester resulted in a loss of £289, and the League hopes that many more public bodies and business firms will subscribe in the future so as to make the organisation a national one. The authorities find that there is an increasing interest in smoke abatement.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

HANDFIELD CHEMICAL CO., Boothfield, Waterfoot, chemical manufacturers. (C.C., 12/12/25.) £22 1s. 2d. November 5.

PREMIER CLEANSER CO., LTD., 118, Holborn, E.C., soap manufacturers. (C.C., 12/12/25.) £10 18s. 1d. November 4.

Receivership

PARROTT'S, LTD. (R., 12/12/25.) P. S. Booth, of Kimberley House, Holborn Viaduct, E.C., was appointed receiver and manager on November 28, under powers contained in debenture dated July 22, 1925.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

ELDERS, WALKER AND CO., LTD., Gateshead, paint manufacturers. (M., 12/12/25.) Registered November 25, £12,000 debenture, to Branch Nominees, Ltd., 15, Bishopsgate, E.C.; charged on property at Gateshead, etc., also general charge. *£535 9s. 3d., bank. May 4, 1925.

O'CEDAR, LTD. (late CHANNELL CHEMICAL CO. (OF ENGLAND), LTD.), Slough. (M., 12/12/25.) Registered November 24, £10,000 debentures; general charge. *Nil. June 17, 1924.

TYSON AND BRADLEY, LTD., Chesterfield, chemical manufacturers. (M., 12/12/25.) Registered November 26, £10,000 debentures (secured by Trust Deed dated November 6, 1925), present issue £6,300; charged on Hipper Chemical Works and dwelling house at Walton, Chesterfield; also general charge. *£4,080 3s. 7d. May 24, 1924.

WARREN (CYNTHIA), LTD., London, S.E., manufacturers of toilet preparations. (M., 12/12/25.) Registered November 28, £288 6s. 9d. debenture, to A. B. Irvine, 49, Palmerston Road, Bowes Park, publisher; general charge.

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Company Winding Up

VAUXHALL CHEMICAL CO., LTD. (C.W.U., 12/12/25.) Winding-up order, December 8.

Company Winding Up Voluntarily

AJAX ANILINE DYE MANUFACTURING CO., LTD. (C.W.U.V., 12/12/25.) By Special Resolution, November 5, confirmed November 24. E. A. Shock, 11, Queen Victoria Street, London, accountant, appointed liquidator.

Bankruptcy Information

ARMFIELD, Nathaniel, 124, Usk Road, Battersea, manufacturing chemist. (R.O., 12/12/25.) Receiving order, December 1. Debtor's petition. First meeting, December 15, 3 p.m., 29, Russell Square, W.C.1. Public examination, December 31, 11 a.m., The Court House, Wandsworth.

New Companies Registered

APEX (BRITISH) ARTIFICIAL SILK, LTD. Registered December 8. Manufacturers of cellulose acetate and other derivatives of cellulose, spinners and manufacturers of real and artificial silk of every kind, etc. Nominal capital, £400,000 in £1 shares (300,000 8 per cent. cumulative participating preference and 100,000 ordinary). A director: E. J. Boake, Widford Lodge, Chelmsford.

BLEACHERS AND DYERS, LTD., Waverley Works, Waverley Road, St. Albans. Registered December 4. Bleachers and dyers; analysts, chemists, chemical importers, etc. Nominal capital, £10,000 in £1 shares (4,000 cumulative preference and 6,000 ordinary).

BRITISH HARD RUBBER CO., LTD., Wharf Road, Ponders End, Middlesex. Registered December 5. Manufacturers of and dealers in hard rubber, ebonite, vulcanite, etc.; chemical, textile, electrical, mechanical and general manufacturers and engineers, etc. Nominal capital, £6,000 in £1 shares.

D. AND S. LABORATORIES, LTD., Warriston Green Works, Canonmills, Edinburgh. Registered December 4. Manufacturing chemists. Nominal capital, £10,000 in 2,000 7 per cent. cumulative preference shares, 6,000 preferred ordinary and 2,000 ordinary shares of £1 each.

KIRKLEES ARTIFICIAL SILK MANUFACTURING CO. Registered December 2. Real and artificial silk mercers, manufacturers, weavers and spinners of chemically or synthetically manufactured yarns, fabrics, films, etc. Nominal capital, £100,000 in 80,000 10 per cent. preferred ordinary shares of £1 and 200,000 deferred ordinary shares of 2s. Solicitor: C. A. Buckley, 2, Booth Street, Manchester.

NASCIO AVELINE AND CO., LTD. Registered December 4. To carry on all transactions relating to the sale of chemicals, dyes, etc. Nominal capital, £500 in £1 shares. A director: H. E. Aveline, 13, Queen's Gardens, Lancaster Gate, London.

NUERA ART SILK CO., LTD., 7, Union Court, Old Broad Street, London. Registered December 5. Artificial silk manufacturers and merchants; manufacturers of and dealers in chemicals, wood pulp, etc. Nominal capital, £420,000 in 300,000 ordinary shares of £1 each and 600,000 deferred shares of 4s. each. A director: Dr. H. Levinstein, M.Sc., F.I.C.

OSWALD M'CARDELL AND CO., LTD., Stretford Chemical Works, Low Moss Lane, Barton Road, Stretford, Lancs. Registered December 5. Manufacturing chemists, drysalters, etc. Nominal capital, £7,000 in 150 6 per cent. preference shares of £10 each and 5,500 ordinary shares of £1 each.

PRELIMINARY SYNDICATE, LTD. 190, Gresham House, Old Broad Street, London. Real and artificial silk mercers and manufacturers, weavers and spinners of real or synthetically manufactured yarns, etc., bleachers, dyers, etc. Nominal capital, £6,000 in 5,900 shares of £1 each and 1,000 "A" shares of 2s. each.

RAYSHEEN, LTD., 43, Castle Street, Liverpool. Registered December 3. Manufacturers, spinners, bleachers, dyers, weavers and dealers in rayon and artificial silk yarns; manufacturers of and dealers in chemicals, drugs, paints, varnishes, colours, dyes, stains and pharmaceutical preparations, etc. Nominal capital, £300,000 in £1 shares. A director: Sir Max Muspratt, Bt., M.P.

SANTORS, LTD. Registered December 5. Dyers and cleaners; dealers in oils, minerals, wax, chemicals, etc., Nominal capital, £5,000 in £1 shares. Solicitor: W. C. Crofts, 5, Copthall Buildings, London.

WESTERN VISCOSE SILK MILLS, LTD. Registered December 8. Spinners of real and artificial silk yarn; bleachers, dyers and finishers, etc. Nominal capital, £400,000 in 300,000 10 per cent. non-cumulative preference shares of £1 and 1,000,000 deferred shares of 2s. each. A director: Sir Max Muspratt.

Germany Increases Dye Exports to U.S.A.

Of the dyes imported into the United States during October, 72 per cent. came from Germany and 5 per cent. from Great Britain. This represents a marked increase for Germany, and figures have been rising for the last six months. For October 366,121 lb. were imported at a value of $339,218.